The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The German Chemical Position

A DETAILED study of the new report, issued by the Department of Overseas Trade, on the economic and financial conditions in Germany, 1925–26 (H.M. Stationery Office, 4s. 6d.), confirms the general conclusion that, although Germany's troubles are by no means over and reactions may occur from time to time, there is no reason why developments from now on should not on the whole be upwards. The nation has once again shown a remarkable power of recuperation, and in no field is the capacity for large reconstruction, rapid adaptation to new conditions, patient treatment of difficulties, and looking and planning a long way ahead better demonstrated than in Germany's chemical and allied industries.

Take first the great potash industry, the condition of which is reviewed by Mr. C. J. Kavanagh, British commercial secretary at Berlin. The general improvement noted in the previous annual report has continued. The conclusion in May, 1925, of the Franco-German agreement in regard to sales abroad had a most beneficial effect; sales both at home and abroad showed a large increase; the differences within the syndicate found a settlement, and the issue at the end of 1925 of the foreign potash loan placed the industry upon a much firmer footing. Further favourable developments depend largely upon an increase in the purchasing power of the home agricultural industry, by far the largest consumer. The long-dated potash credit recently granted by a large banking group is a step in this direction, and it is hoped that similar measures will be introduced for potash sales. The sales for 1925 show an increase of almost 50 per cent. over the 1924 figures. As regards inland prices the figures for 1925 are in most cases about the same as in 1913, though in several instances the prices are lower. The increase in prices of some 5 per cent. made in April of 1925 was not sufficient, it is claimed, to meet increased wages and higher discounts.

In place of the Franco-German potash agreement, relating only to the North American market, an agreement has been concluded which provisionally fixes until August 30, 1926, the division of sales to all foreign countries, the share of the Alsatian industry amounting to 30 per cent. as against 32 per cent. fixed in the previous agreement. Negotiations for prolonging this agreement are reported to have been so far successful that the provisional agreement is to be converted into one of at least seven years duration. The proportional allotment of sales to foreign markets between the German and French industries will be retained at 70 and 30 per cent. respectively, up to an amount of 840,000 tons, while sales in excess of this amount will be divided equally between the two industries. The period for the voluntary closing down of shafts with a view to concentrating production in the most productive works came to an end on December 31, 1925. Of the total of 224 shafts, 71 are now in commisison. The chief new by-products plant which has been laid down is the Wintershall potassium chloride factory near Merkers. The effect of the recent potash loan has been such that, providing sales remain normal, it is expected that the industry will be in a position again to issue dividends.

Further Developments in Prospect

ALTHOUGH in certain branches of foreign trade German firms have suffered a direct loss, they have very important achievements to their credit at home, notably in the sphere of nitrogen fixation and fertiliser production and in the manufacture of synthetic methyl alcohol. The great combine has not been content to rest on its laurels in dyes alone, and has advanced rapidly to fresh conquests, for which, principally, they have to thank their foresight in encouraging the enlistment to their ranks of large numbers of technically trained chemists, and minutely directing their efforts to definite ends. In experimental work they have shown extraordinary patience and perseverance and have ever been ready to finance a line of investigation which, although holding no immediate prospect

of results, was, nevertheless, sufficiently promising to return its due reward. The horizon which the advance in chemical technology opens out to them with their very perfected mechanism is so vast and requires such a close degree of collaboration that a central control has been considered absolutely necessary to replace what was regarded, even before, as a fine example of team work in applied science. Thus, in its new structure, the I.G. Farbenindustrie A.G. represents a singularly strong combination; it is directed by the ablest brains in Germany and represents a well-balanced unit, not only from the technical, but also—which is more important—from the financial standpoint.

In reference to nitrogen fertiliser development considerable extensions and improvements of the Haber-Bosch plants at Leuna and Oppau are reported to be imminent, while the yield of pure nitrogen production is expected to reach some 450,000 tons a year. The production of synthetic methyl and butyl alcohols has proceeded apace, and in this also an increasing manufacturing capacity is said to have been decided upon. Exports of both these products have shown a very remarkable increase within the last two years, principally to the United States. Apart from butyl alcohol the I.G. Farbenindustrie produces a wide range of solvents for the varnish and celluloid industries, and it is reported that the Höchst works are entering the field of varnish production. In artificial silk also the combine is showing considerable activity and has arrived at certain understandings with German manufacturers.

Of the activities of the combine in the sphere of synthetic fuels from coal, the report hesitates to speak with any precision. Professor Bosch at the annual meeting of the I.G. Farbenindustrie reported that the work upon hydration had led to promising results and that their co-operation with foreign concerns in the Deutsche Gasoline A.G. was intended to promote their interests in the sales organisation of the oil trade. To this interesting subject further reference may be made in our next issue.

Chemicals and Dyes

As regards German chemical trade in general, this, like other industries, was considerably affected by the financial crisis of 1925. For the first time in recent years the margin between productive capacity and demand became acutely accentuated, and there followed a general contraction of operations which has continued up to the present time. Taking the foreign trade statistics, a glance at these shows that as far as exports are concerned the year 1925 showed a considerable improvement over the preceding year in point of values. As compared with 1913, when the total value of exported chemical products was about 770,000,000 marks, or about 7½ per cent. of the total value of foreign trade, in 1925 the export of chemicals attained the figure of 898,000,000 marks. Making allowances for the increased prices over the pre-war basis the weight of exports would seem to have reached its pre-war standard. In view, however, of the large extensions of manufacturing capacity, the ratio of exports to production has naturally suffered an appreciable decrease. The import duties introduced since the abolition of import licences on a number of chemicals, including some in the manufacture of which Germany is particularly strong, have placed German manufacturers in a favourable position for exploiting the home market. Complaints, however, have been directed against the duties on hydrochloric and sulphuric acid, varnishes, basic phosphates and superphosphates, and pure glycerine.

As regards the German dye industry, the most striking feature of the present review is the thought and energy expended in consolidating the position of the large firms which previously made up the I.G. In addition to the manufacture of dyestuffs, the new combine also has interests in works producing nitrogen fertilisers, various acids, including oxalic and formic, pharmaceutical and photographic chemicals, films, film and tracing papers, artificial silk (viscose, acetate, cuprammonium), motor spirits (methyl alcohol, butyl alcohol, and motalin), lubricating oils, volatile oils and perfumes, aluminium, copper and electron ferro-alloys (molybdenum, wolfram), gypsum, zinc-white, artificial horn, synthetic resins, varnishes, artificial precious stones, tanning materials, etc.

There is little doubt, in the opinion of Mr. Kavanagh, that the large dye groups have seriously felt the challenge thrown out to them by the various new dye industries established outside Germany since the war. The German dye works, he points out, hold now no virtual monopoly of the bulk trade in dyes, and, in having to face the high tariffs of the new producing countries, are called upon to deal with a situation vastly different from that which existed before the war. Whereas then their principal field of enterprise was in dyes and pharmaceutical products, their manufacturing basis is now heavily loaded on the side of nitrogen fertilisers in a variety of combinations, and indications are plentiful of important additions to their spheres of interest.

It is intended by the complete fusion of interests to maintain a better control of the production apparatus and the distribution of work among the member firms, in order to effect the utmost economies in administration and manufacturing costs. The vast number of colours and colour nuances, which was the result of a fairly wide competitive field hitherto obtaining, will, it is said, be considerably reduced, and greater economy and progress are expected from a closer form of specialisation within the group and from the redistribution of manufacture of certain ranges of chemicals which best fit in with the experience, efficiency, and manufacturing programme of the separate units of the concern. By a so-called "rationalisation" of production, which aims at the elimination of all redundancy in the manufacturing processes, in the utilisation of staff and in the allocation of new work, better results are expected.

Registration and its Difficulties

It is clear from the statement of the committee appointed by the Institute of Chemistry to consider the question of registration of chemists that the proposal, attractive though it may be at first sight, raises a number of serious difficulties. One of these is the question whether registration is to be voluntary or

compulsory. The committee finds that compulsory registration is not a practical proposition at the present time. If, on the other hand, a voluntary system were adopted, a lower standard of qualification than that demanded for the Associateship of the Institute would acquire some measure of recognition; in this case (assuming that registration were carried out by the Institute) it might be necessary to adopt some third grade of membership, such as "Affiliated Member," which, while implying some degree of qualification, would not be confused with the Fellowship or Associateship. The committee take an unfavourable view of this suggestion, being of the opinion that the effectiveness of voluntary registration would be questionable, and that the establishment of a third grade of membership of the Institute is undesirable. The statement is to be transmitted to local sections of the Institute for their consideration, and on receiving replies and concrete proposals from them the committee will report further to the council.

The general tone of the statement leads to the inference that there is no immediate prospect of registration coming into being. At the same time it is clear that some chemists are already looking a long way ahead of it. In some considerations on the subject which were prepared for the Manchester and Liverpool Sections of the Institute it is suggested that "a movement for the institution of a register of all professional chemists would be definitely a step towards an attempt to obtain more complete authority for the government of the profession, subject only to the authority of, say, the Privy Council." The road leading to the consummation of that desire is likely to be a long and hard one. It is really a question which affects not only chemists, but all scientists and technicians. On this account it seems desirable that a joint committee of chemists, physicists, engineers, and others concerned should be appointed to consider broadly the question of the registration and government of scientific and technical men. The findings of such a body would be of great interest, and the general principles laid down could be applied by each group to its own case. The interest of the public in the matter will also have to receive consideration, and sooner or later an investigation of the subject may have to be made by some body on behalf of the Government to secure equal consideration for every point of view.

Anglo-German Industrialists' Conference

It was recently reported that Sir Max Muspratt, during his tour in Germany, had had some informal discussions with Dr. Duisberg relating to commercial problems. A purely personal meeting between the President of the Federation of British Industries and the head of the German Industrialists' organisation would in any case have an interest, but it promises to be attended by far more important results, for it is now announced that a conference of leading British and German industrialists is to be held in London some time this month. This meeting will be representative of the coal, iron, steel, and chemical industries of both nations.

The information about the objects of the meeting is too general to justify much in the way of comment, but it would appear to be part of the general movement towards friendly international understandings between the great productive industries with a view to the fixation of economic price levels and possibly to some rough allocation of markets. In view of the present economic position of Europe, price-cutting campaigns between nations as between individual firms, are ruinous. The momentary gain to the firm or nation that resorts to uneconomic prices to capture business is speedily lost in the general damage done to industry as a whole, and in the long run the original culprit suffers with the rest. The establishment of prices bearing a rational relation to economic production costs is a thoroughly sound policy, and though we have no specific information on the point, it is hardly likely that any body of British and German industrialists could meet round a table without discussing this and similar problems.

Books Received

A Catalogue of British Scientific and Technical Books Supplement, 1925. Arranged by Daphne Shaw. London: British Science Guild. Pp. 166. 2s. 6d.

The Dispensatory of the United States of America. By Horatio C. Wood and Charles H. La Wall. London: J. B. Lippincott Co. Pp. 1,790. 65s.

Theoretical Organic Chemistry. By Francis Arnall and Francis W. Hodges. London: J. and A. Churchill. Pp. 372. 10s. 6d.

The Calendar

Se. 6—Oct. 3	Société de Chimie Industrielle: Sixth Congress of Industrial Chemistry.	Brussels.
4	Society of Chemical Industry (London Section): "Recent Advances in Catalysis." Dr. E. K. Rideal. 8 p.m.	Burlington House, Piccadilly, London.
4	Sir John Cass Technical Institute: Inaugural Ceremony. Address by Sir Charles C. Wakefield. 8 p.m.	London.
4	Institution of the Rubber Industry (London Section): "The Problems of Rubber Latex Concentration and the Industrial Application of Concentrated Latices." Dr. Ernst A. Hauser. 7.30 p.m.	Engineers' Club, Coventry Street, Piccadilly, London.
5	Institute of Metals (North-East Coast Section): "Preparation and Metallography of Metal Filaments." C. J. Smithells. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
6	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London, W.1.
6	Society of Chemical Industry (Glasgow Section): "Notes on the Testing of Disinfectants by the Rideal-Walker Method." Quintin Moore, junr. 7.15 p.m.	Scottish Electric Lighting Service Bureau, 20, Trongate, Glasgow.
7	Society of Chemical Industry (Bristol Section): "Insulin and its Manufacture." Francis H. Carr. 7.30 p.m.	Chemical Dept., Bristol University.
11	Ceramic Society: "Ignition of Gases." Professor H. B. Dixon. 7.30 p.m.	Central School of Science and Technology, Stoke-on-Trent.
11	Institute of Metals (Scottish Section): Chairman's Address—S. E. Flack. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
12	Institution of Petroleum Technologists.	John Street, Adelphi, London.
12	Institute of Metals (Birmingham Section): Chairman's Address—Arthur Spittle. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
14	Institute of Metals (London Section): Chairman's Address—A. H. Mundey. 7.30 p.m.	83, Pall Mall, London, S.W.1.
15	Institute of Metals (Swansea Section) Chairman's Address—Capt. L. Taverner. 7.15 p.m.	Metallurgical Dept., University College, Singleton Park, Swansea.

Physical Phenomena and Molecular Orientation

A Faraday Society Discussion

Yesterday (Friday) the Faraday Society held a general discussion in London on "Physical Phenomena at Interfaces, with Special Reference to Molecular Orientation." Below are published abstracts of the papers read.

THE discussion opened with an introductory survey of the subject by Dr. E. K. Rideal, who pointed out that the necessity for a detailed study of physical phenomena at interfaces was now recognised as of urgent importance to science. There appeared to be a real danger that colloid chemistry, especially in its biochemical and physiological aspects, might sink into disrepute beneath the waves of a sea of nomenclature which conveyed nothing to the mind of the average scientific reader.

In the case of insoluble films on a liquid surface the evidence for a two-dimensional unimolecular phase capable of existing in the solid, two liquid, the condensed and expanded, vaporous, gaseous, and allotropic solid states had been amply confirmed and extended in a variety of ways. From the experiments of Hardy, which had been most exhaustively extended by Harkins and his pupils, they had fairly conclusive evidence that "polar" groups inserted in hydrocarbons actually combined with water with a definite loss in free energy. Whether this combination was stoichiometric or atmospheric or again limited, in the sense employed in Werner co-ordination compounds by considerations of size, was at present unknown, but some form of union would appear to be essential. There was direct evidence for the orientation of molecules adsorbed on solids. It seemed difficult to avoid the conclusion that a particular special disposition of several atoms on the surface was required for a specific catalytic action, this configuration being associated with some type of field which held the adsorbed reacting molecule in some particular distorted configuration, neither field strength, as determined by the adsorbing power, nor configuration alone being sufficient to define a catalytically active patch.

Electrification at Interfaces

Professor H. Freundlich, of the Kaiser Wilhelm-Institut, Berlin, read a paper on "Electrification at Interfaces." The distinction between the thermodynamic potential and the electrokinetic potential, he said, was the factor which governed electrification at interfaces. The thermodynamic potential, also called Nernst's potential, was the potential of a single electrode in a galvanic cell, or, more generally speaking, any potential at an interface which was measured vertically to that interface. The electrokinetic potential, on the other hand, was met with in the electrokinetic phenomena of electric endosmose, cataphoresis, stream-potential, etc., in these cases measured tangentially to the interface. Professor Freundlich's discussion referred mainly to the interface between a solid and a liquid. Two assumptions must be fulfilled in order to make this distinction between the two potentials. Firstly, the electric double-layer which they assumed at the interface must not be a double-layer in the strict sense of the word, as first suggested by Helmholtz. Secondly, they must assume that a thin film of liquid adhered firmly to the solid walls of the other phase. He believed they had good physical reasons for accepting those two assumptions. He proceeded to show that the distinction between the thermodynamic and electrokinetic potentials were a valuable guide to the manifold phenomena correlated with the electrification of interfaces.

In a paper on the same subject as Professor Freundlich's, Dr. R. K. Schofield concluded that by restraining free kinetic movement the interfacial forces which caused adsorption and molecular orientation set up a distribution of volume electrification, thereby giving the interface an electric moment and hence a transverse difference of potential. The study of the electric moment of an interface by observation of the relation, its change to the accompanying change in surface-tension, was best carried out by using to the full the thermodynamic adsorption equation of Gibbs before turning to inductive reasoning. Gibbs' method revealed great complexity in the ionic and molecular arrangements that went to make up the electric moment of an interface, and showed the complete inadequacy of the simple theory of an interfacial "condenser." In particular, it showed that the disturbance set up by a charged mercury surface in a neighbouring solution extended to a considerable depth (tens of A.U), and was such as to support the view that throughout part at least of the region carrying volume electrification, the ions were separated by a medium of which the dielectric constant did not differ greatly from that of water in bulk. That fact was of importance in the quantitative discussion of electrokinetic phenomena. Molecules which were orientated at an interface and had electric moments, either inherent or induced, though they contributed to the total potential difference, could not bring about electrokinetic phenomena, for the appearance of which the possibility of a relative movement of two layers carrying volume electrification of opposite sign was essential.

The Spreading of Proteins

A paper "On the Spreading of Proteins" was read by Professor E. Gorter and Dr. F. Greudel. The results showed that proteins might spread on water in a mono-molecular layer. Hæmoglobin, casein, serum-proteins and muscle proteins spread in a film having a thickness of only 6-7·5 A.U. if a suitable hydrogen ion concentration (mostly P_H 1) and temperature were chosen. Other proteins (gelatin, gliadin) did not spread well. Proteins, spread on distilled water, did not show this minimal value for the thickness of the layer. Time had a considerable influence under these conditions, whereas it had none if they used strongly acid water.

The influence of hydrogen ion concentration on the thickness of the film was, that at the iso-electric point and at a P_H 1 or 2 the mono-molecular very thin film was obtained, but that at both sides of the iso-electric point the thickness was far greater. Often the thickness of these films was about three times greater than the mono-molecular. Temperature tended to promote the spreading only of proteins of the hæmoglobin casein type, but the spreading of proteins of the gelatin gliadin group was better at lower temperature.

"Adsorption on Solids, with Special Reference to Molecular Orientation" was discussed by Dr. W. E. Garner. In regard to the solid surface, he pointed out that Langmuir, in his summary of the evidence, had concluded that both chemical and subsidiary valency forces—that, is, physical forces—were operative in surface phenomena. The surface forces were but the outward manifestation of those which existed between the atoms and the molecules in the interior of the crystal. Where the atom was the structural basis, as for the elements and most metallic salts, the surface energy was mainly atomic. The surfaces of crystals, in which the molecule was the crystal unit and the binding forces were the subsidiary valencies, were less unsaturated than those above, and unless the molecules contained unsaturated groups the crystal surfaces possessed but a small adsorptive power and catalytic activity.

Dr. Garner went on to point out that the molecules in an adsorbed film were normally held on the surface by those groups which the more readily entered into combination with the surface atoms. Evidence of molecular orientation by surfaces was available from the behaviour of crystalline liquids at plane surfaces and in the mode of crystallisation of long chain acids on the surface of mica. Also, Constable and Palmer had shown from measurements of the velocity of decomposition of alcohols on the surface of copper that the temperature coefficient of the reaction for different alcohols was constant. This they explained as due to the terminal group, CH_2OH, being adsorbed by the surface in all cases.

Surfaces of Pure Liquids

Discussing "The Arrangement of Molecules at the Surface of Pure Liquids," Dr. S. Sugden said that it was the object of his paper to show that the surfaces of most pure liquids did not exhibit the properties which would be expected if their molecules were arranged in a regular manner.

Langmuir, and Haskins, Davies and Clark had independently suggested that the total surface energy of pure liquids was largely determined by the orientation of molecules in the surface layer. The quantity which was presumed to be determined largely by the exterior atoms or groups was the total surface energy. Dr. Sugden gave reasons for the view that such an ordered arrangement of the surface molecules as that indicated above did not affect the total surface energy

as it would be expected to do, and that the kinetic theory set definite limits to the existence of any large degree of orientation. From these considerations he was of the opinion that the surface properties of pure liquids were best accounted for by the theory of a random distribution of the surface molecules.

In recent work, said Dr. G. Shearer, dealing with "Molecular Orientation in Solids," it had been shown that, under suitable conditions, certain types of molecule had a strong tendency to form layers which, although not solid, possessed a very high degree of orientation. There was an ever-increasing volume of evidence that the molecule in the solid state was of very similar nature to the molecule in the liquid or gaseous state. If this were granted, it would appear probable that, in those cases where a certain degree of orientation was found, this orientation should be that arising from the partial success of an attempt to form a true crystal. The arrangement of molecules in an oriented film, for example, should be a replica, more or less perfect, of some aspect of the orientation found in the crystal.

Results of X-Ray Measurements

Dr. Shearer then described the results of X-ray measurements of crystals of substances having a long open chain of carbon atoms. It was found that in these compounds that there was one set of planes in the crystal whose distance apart, or spacing, was very much greater than that of any of the other planes, and it could be shown that in one case we had to deal with an arrangement in which successive identical planes were separated by a single layer of molecules, while in the other there was a double layer. If the molecule had at one end a group which was chemically active, such as COOH, then the double layer would be found; if both ends were inactive, as in hydrocarbons, only a single layer occurred. When the results of X-ray work were compared with those obtained by a study of thin films, it could be seen that there was a close relation between the type of orientation found in molecular aggregates other than solids and that which was the principal characteristic of the crystal. The study of films of the long chain compounds showed that they very readily formed layers in which the molecules were arranged side by side, parallel to one another. Adam's measurements of the cross-section of the molecules in close-packed films agreed with those determined by X-ray work.

The double and single layers found in the long chain crystals probably had a considerable bearing on the possibility of the formation of oriented films. Speaking generally, it would appear that those substances which formed into crystals with double molecular layers were those which readily gave rise to highly oriented films. The film of, say, stearic acid on water, although of monomolecular thickness, should probably rather be considered as a double layer of oriented molecules, the one layer being acid, the other water, with their active groups oriented towards one another. It appeared that they were justified in assuming that any attempt at orientation was essentially an attempt at crystallisation.

Insoluble Films on Water

The subject of "Insoluble Films on Water Surfaces" was dealt with by N. K. Adam and G. Jessop. They stated in their paper that if an insoluble and non-volatile substance, which formed a stable film, was spread on the surface of water, it exerted an outward force on a barrier in the surface, provided the far side of the barrier was in contact with clean water. This force was the "surface pressure." The molecules, being insoluble, were confined to the surface. They occupied space and might be regarded as small hard objects. If not aggregated together into masses, they partook of the thermal agitation of the water molecules; but since they were insoluble, only the two components of translatory movement in the surface could produce displacement of molecules over considerable distances.

If the molecules had an average kinetic energy of translation in each degree of freedom, $\frac{1}{2}$ RT, and were small and not subject to appreciable aggregating forces, the surface pressure F obeyed a "perfect gas" relation $FA = RT$. When the films were below a critical temperature, which depended on the constitution of the molecules, there was a region of constant surface pressure, apparently exactly analogous to vapour pressure. These vapour pressures had never been found greater than about 0·3 dynes. In the region of constant pressure, the isothermals indicated that there must be two surface phases in equilibrium, liquid and gaseous. It would be exceedingly interesting, though no doubt difficult, to attempt detection of the one-dimensional analogue of surface tension between liquid and gaseous films. The "liquid" film to which the gaseous film condensed might be either the "condensed" film, or the "liquid expanded" film. The condensed films were the form first discovered; it was in them that the molecules were closely packed and orientated perpendicular to the surface. The "liquid expanded" films were more compressible and had a greater area than the condensed films.

Professor W. Ramsden, in a paper on "Some Physical Properties of Composite Surfaces," said that the fact that adsorbed molecules passed partly out of solution at the free surfaces of aqueous solutions of many tension-lowering solids of high molecular weight was shown by their yielding solid "massed adsorpta" when, by appropriate methods, the surfaces were "swept up." The molecules concerned were held to be in direct contact with both gas and water. It was theoretically probable that additional molecules were adsorbed in relatively small numbers into the aqueous surface-regions below those. Some adsorption-surfaces were extremely viscous or even rigid (such as saponin and nearly all proteins) and the adsorbed particles must then be in direct mutual contact. Others were freely mobile (such as quinine and soaps) and the particles must then be either more widely spaced or so orientated that only "liquid" cohesions came into operation—far more probably the former. Nearly all "massed adsorpta" were completely resoluble, but some, such as those of albumin and fibrinogen, were insoluble.

Lead Poisoning: Workmen's Compensation Case

In the Shoreditch County Court, on Thursday, September 23, before Judge Cluer, there was an application for a settlement of a Workmen's Compensation Act case, in which the applicant was Daniel Green, of 7, Beach Road, Old Ford, Bow, E., a metal smelter, the respondents being E. A. Austin and Sons, of Atlas Wharf, Berkshire Road, Hackney, N., metal and general refiners.

Mr. Baster appeared for the applicant, and said that he had been earning £3 a week, and had been certified as suffering from an industrial disease, which was plumbism, or lead poisoning, and he was totally incapacitated. He had been paid 30s. a week for total incapacity from February 27, 1926, to date, and it was now suggested that a settlement should be arrived at, the respondents offering £100 in full settlement of all claims. This offer had been heard by the Registrar of the Court, who had refused to sanction its acceptance, on the grounds of the inadequacy of the amount. His Honour would no doubt observe a medical certificate filed with the Court papers, in which it was admitted that the applicant was totally incapacitated at the present time, but anticipated that the applicant would be fit and well to do his ordinary work in six to twelve months time, although there was every reason to expect that he would find a light job before that date.

Judge Cluer: The Registrar says that plumbism is an industrial disease?

Mr. Baster: Yes, your Honour, and it is not disputed that he is suffering from it. Your Honour will see——

Judge Cluer: Here is a very rash medical man who anticipates that the applicant will make a complete recovery in from six to twelve months. This doctor might just as well give me a certificate that in ten years' time there will be nothing the matter with me. I cannot, of course, without some satisfactory evidence, say that the doctor is right. It is not safe to guess. This is a form of an appeal from the Registrar, but I cannot see how I can differ from his decision.

Mr. Baster: I think perhaps that I might tell you a little about the case. There are no nerve symptoms, and——

Judge Cluer: I am afraid that I do not know anything about this disease, what effect it has, or anything about it.

Mr. Baster: It affects the wrist, but I am told it did not do so in this case.

Judge Cluer: The Registrar says that the amount is inadequate, and I can see no ground for differing from his opinion. You will have to continue his compensation until you have a review.

United Alkali Extensions

Opening of New Offices at the Gateshead Works

As briefly reported in our last issue, the formal opening of the United Alkali Co.'s new offices at the Allhusen's Works, Gateshead, took place on Thursday, September 23, and attracted an influential gathering. Before the ceremony, a tour of the works was made by Sir Max and Lady Muspratt, who were received by the general manager (Mr. A. N. Davidson), and later the company present were entertained to luncheon. The new offices are designed to secure closer relations between the technical, commercial, and works staffs, and illustrate the company's policy of keeping the organisation abreast of the latest developments.

Sir Max Muspratt presided over the opening ceremony, which was gracefully performed by Lady Muspratt, in the presence of a large gathering which included the Lord Mayor and Lady Mayoress of Newcastle (Councillor and Mrs. Oates), the Sheriff and Lady Sheriff (Mr. and Mrs. R. J. Thompson), the Mayor and Mayoress of Gateshead (Alderman and Mrs. Peacock), Sir Arthur M. Sutherland, Bart., Sir William J. Noble, Bart., Major-General Sir R. A. Kerr Montgomery, Dr. G. C. Clayton, M.P. for Widnes, Mr. R. S. Dalgliesh, Alderman R. Mason, Mr. T. W. Stuart, Mr. James Nelson, Mr. R. M. Bewick, Dr. Conroy, Mr. A. Selby Wood, Mr. J. T. Naisby, Mr. H. Muspratt, Mr. A. W. Reichwald, and Mr. A. N. Davidson, general manager.

The toast of "The Prosperity of Tyneside" was proposed by Dr. Clayton, M.P., who paid a high tribute to the talent of Tyneside craftsmen. He felt that with a community possessing such craftsmanship and pluck the prosperity of Tyneside was bound to return. We could not be a divided camp and compete against our competitors abroad.

(From a photograph kindly lent by the "North Mail and Newcastle Daily Chronicle.")

LADY MUSPRATT RECEIVING A BOUQUET FROM MISS RUDGE AFTER THE OPENING CEREMONY.

Labour and Industry

The Mayor of Gateshead, in replying, said that Labour was sometimes accused of retarding the welfare of Tyneside. Criticism was often of the noisy kind, and not backed up by much knowledge. He spoke with a keen desire to promote the best interests of the community. They had been told so often to face the economic facts and that they could not get more out of an industry than they put into it, that these slogans had become nauseous, just as another noted slogan had become so in other spheres. When they were dealing with economic facts they must also remember they were dealing with the lives of men and women. He wanted them to understand that while they of the Labour Party were trying, from their point of view, to improve the lot of the individual, they were trying to do what they could for the welfare of the nation, of which they were as proud as anyone. The craftsmen of this country were the best in the world, and if they got a fair crack of the whip they would respond. They of the working-class movement wanted to see commerce thrive; and they wanted to help to close the gulf that existed between the employers and the employed. They wanted to get closer together and to understand each other better than they had done in the past. They must come to the conclusion that the strike was not the only means of getting justice. It was an unsatisfactory means and they wanted something better—something more scientific and more just.

The Lord Mayor of Newcastle said the Mayor of Gateshead's speech was what they needed—plain talk and a reasonable and natural attitude around the table. If they had that he felt sure that strikes would be no more. A little more of the human touch was needed. He believed that if the coal stoppage were ended there would be better times for Tyneside.

Mr. A. N. Davidson moved a vote of thanks to Lady Muspratt, and presented her, as a souvenir of her visit, with a silver Backworth bowl, being a reproduction of a Roman vessel of about the year A.D. 150. The original was found at Backworth in 1811. The bowl, an artistic piece of work, was supplied by Messrs. Reid and Sons, Newcastle.

Mr. McKellar, on behalf of the architects of the new building, Messrs. Cackett and Burns Dick, presented Lady Muspratt with a very pretty gold trinket box.

Lady Muspratt, in returning thanks, said she hoped that in the new building the great traditions of the Alkali Co. would be fully maintained.

Sir Arthur Sutherland proposed the toast of the United Alkali Co., and recalled the fact that his father was, in the middle of last century, manager of the Friars' Goose Chemical Works, which afterwards passed into the possession of the United Alkali Co.

Sir Max Muspratt

Sir Max Muspratt, in replying to the toast, said that the chemical industry with all its past vicissitudes was an extraordinarily educational industry. They had tried to pursue a progressive policy, and out of the thirteen or fourteen works of previous days they had built up a great united enterprise. In numbers, the chemical industry was not so large as some, but it was a very vital industry, not only to the United Alkali Co. but to the country as a whole. During the progress of all the alterations they had learned a great deal, and he thought they had to learn a great deal more. Just as the processes of industry had altered, so had social conditions altered with them, and no industry could hope to be successful if it did not try to understand the human problem quite as much as the technical problems. Tyneside had given the United Alkali Co. a man who stood supreme in this country with regard to good relations between labour and employers. He referred to Mr. Stuart, who went from Hebburn to Liverpool, and had followed up changed conditions without ever losing touch or sympathy with the workmen. He believed that the United Alkali Co., taken all round, was the strongest company in the world at the present time. Though obviously there were great problems to be solved they believed in complete understanding and sympathy from top to bottom in the undertaking. It was being developed all the time. He thought that by these means they could help to solve not only the problems of the chemical industry but of the Empire and the world. If they brought to bear all their powers of brain and experience and of human sympathy to carry on united, they would lead the world on to wiser lines.

Sir Max concluded by proposing the toast of "The Guests," and Sir William Noble responded. This closed a very happy and successful ceremony.

Reviews

STONE DECAY AND ITS PREVENTION. By J. E. Marsh. Oxford: Basil Blackwell. Pp. 58. 3s. 6d.

As the result, more particularly of examinations of a specimen of limestone from an Oxford building, of a calciferous sandstone from Glasgow, and of a silicious sandstone from Delhi, Mr. Marsh puts forward the view that stone decay is mainly of a twofold character. In the first place, there is "decay of the surface, attrition by wind and dust and rain, expecially acid rain." Secondly, there is "decay most active just beneath the surface, but affecting also the surface layer, found especially in the more sheltered places." The author's belief in this second form of decay, on which he places very much stress, arises out of his discovery of nitrate in the three stones mentioned above. Stone is thought to contain micro-organisms, which convert ammonia (reaching the stone from the atmosphere) into nitric acid. As a result soluble nitrates, of calcium, sodium, etc., are formed, which are easily washed out; even if washing out does not occur, and if the calcium nitrate is partly converted back to carbonate, the original texture of the stone is not reproduced. The stone becomes disintegrated and crumbling. The occurrence of such a process below the surface would explain the well-known exfoliation of stone, *e.g.*, flaking of the surface in comparatively large pieces. There is support for this belief in "catalytic" action by micro-organisms in certain experiments cited by the author, in which part of the ammonia in ammonium sulphate was converted to nitric acid when a solution of the salt, together with oxygen, was forced through limestone from a building.

The micro-organisms and other incidental elements giving rise to the phenomenon above are acquired from air, rain, and dust. "All these things may be summed up in the word dirt." The upshot is that stone, to be maintained free from decay, should be kept clean and sterile. It is suggested that a good method of sterilising the stone is to increase its alkalinity by the use of lime or cement wash, soda, potash, etc. The author has found that the simplest method of at once cleaning and sterilising is the application of sodium peroxide solution. "This method of cleaning is particularly suitable for all kinds of carved work such as statuary." The use of lanoline is also suggested. The author argues his case with much ingenuity, and the book is so pleasant and readable that it deserves a wide circulation.

THE PREPARATION AND ANALYSIS OF ORGANIC COMPOUNDS. By J. Bernard Coleman, A.R.C.Sc., F.I.C., and Francis Arnall, Ph.D., M.Sc., F.I.C. London: J. and A. Churchill. Pp. 352. 15s.

The purpose of this book is "to place before the student a comprehensive course of practical organic chemistry." After a section dealing with the purification of organic compounds and the determination of their physical constants, details are given of the preparation of about 100 substances, the experiments being so described that the student can carry them out without the necessity for constant supervision. The identification of organic bodies is then dealt with. "In this section a serious endeavour has been made to systematise organic analysis, and to adopt the orderly arrangement that is familiar in inorganic chemistry. For this purpose a definite scheme of analysis, a considerable part of which is original in conception, is set out, and this section includes some fifteen tables of analysis, by means of which the substance is definitely placed in a particular sub-group. Detailed tables of the characteristic properties of the more common organic compounds are also given, in order to identify definitely the individual substance. These detailed tables, some thirty-seven in number, give the principal characteristics of some 650 compounds. In addition, the separation of mixtures of organic compounds is described, and three tables of analytical separation are given."

The next section of the book discusses the ultimate analysis of organic substances. In view of the well-known advantages of the micro-analytical method, some description of the technique might be added to future editions of this book. The closing pages deal with the determination of molecular weights and the estimation of typical groups, and there is a short discussion of the determination of the relative amounts of ortho, meta, and para isomers in a mixture by solubility and freezing point methods.

COLLOID CHEMISTRY, THEORETICAL AND APPLIED: VOLUME I, THEORY AND METHODS. By Jerome Alexander. New York: The Chemical Catalog Co., Inc. Pp. 974. 14·50 dollars.

This substantial volume consists of 60 complete monographs by a number of well-known chemists. In a subject such as colloid chemistry, where the formulation of the fundamental laws is far from complete, such a collection of diverse or sometimes even conflicting views has very much the effect of a public discussion, namely, a co-ordination of ideas; it should assist in transforming opposing conceptions into universally acceptable views. It would be an invidious task to name the best in such a volume, but certainly large groups of readers will be specially interested in the articles by Sir W. H. Bragg and Einstein, and the notes on astronomy, the ultra-centrifuge, ultra-filtration, and the preparation of colloidal solutions with the aid of grinding. The book caters for all types of readers. There are easy chapters, such as that on the structure of gels; on the other hand, the perusal of the mathematical papers demands intensive work and implies a sound training in higher mathematics. In short, this symposium forms a valuable addition to colloid-chemical literature.

S. P. S.

HISTORY OF THE INTERNATIONAL LABOUR OFFICE. By the Right Hon. G. N. Barnes. Williams and Norgate. Pp. 106. 3s. 6d.

The Right Hon. G. N. Barnes is remembered by most people as one of England's "Big Five" during the war. This makes it the more pleasing to find that he has been working quietly and unassumingly ever since 1919 at a task of international importance—the direction of the International Labour Office, whose history forms the subject of his new book. It is characteristic of Mr. Barnes that he never mentions himself, except incidentally in a list of the officers of the I.L.O. This office forms the "Civil Service" of the International Labour Organisation founded in 1919 under the auspices of the League of Nations as a part of the League to deal with world labour problems. Briefly, the function of the I.L.O. is to find where injustice in labour conditions exists, and to suggest remedies. For this purpose annual conferences are held, at which "conventions" and "recommendations" are drawn up. A "convention" is a suggested form of legislation, to be introduced by the separate national governments, and since each nation is represented at these conferences by a government official, the acceptance of a "convention" by a majority at the conference virtually means that the laws proposed will be introduced internationally. A "recommendation" is similar to a "convention," but, as its name implies, is not in any way binding on individual governments. In effect this distinction is only a form of words, because in practice "conventions" and "recommendations" alike have been made law by the smaller European nations, and have been disregarded by the larger powers. Of the "conventions" adopted by the I.L.O., the abolition of white phosphorus is the only one which has been almost universally accepted. The eight-hour day proposals, of which such high hopes were entertained, have failed to secure general adoption.

While admitting that in its short history the I.L.O. has had enormous handicaps to contend with (the complete indifference of the United States being the chief among these) it must be confessed that the enthusiastic public-spirited men who are behind the organisation have been working along wrong lines. The machinery which they have created is altogether too ponderous, as is shown by the history of a typical "convention," adopted by the conference in 1920. This was taken up by the British Labour Government in 1924, dropped with the fall of that Government, revived in 1925 by the Conservatives, and the final ratification was not reached until March, 1926. It is now beginning to be realised that the model employer who pays high wages for short hours can compete favourably with his rival who produces a similar article by sweated labour. The I.L.O. would be doing a wonderful service if it were to devote its machinery to the emphasis of this and similar little-known truths, rather than spend its energies in framing "conventions" which, even if they are accepted by the nations in the course of many years, may only lead to friction when one country disregards a "convention" which it has promised the others to obey.

The Future of Liquid Fuels

The Work of Bergius and Fischer

THE Institution of Fuel Economy Engineers held its first meeting of the session at the Royal Society of Arts on Friday, September 24, when Sir James Kemnal (of Babcock and Wilcox, Ltd.) presided in the absence of Sir Alfred Mond, the President. Sir Alfred Mond has also recently accepted the presidency of the newly formed Institution of Fuel Technologists, and it was made clear at the meeting on September 24 that the Council of the Institution of Fuel Economy Engineers —which has been negotiating unsuccessfully so far with the Institution of Fuel Technology as to amalgamation in some form—was unaware of the fact that Sir Alfred had accepted the presidency of the new institution when it approached him early in July last inviting him to be president of the Institution of Fuel Economy Engineers. Sir Alfred, however, in accepting the second presidency, has promised to use his best endeavours to bring the two institutions together, and the Council of the Institution of Fuel Economy Engineers expresses the hope that he will be successful in persuading the fuel technologists that there is a necessity to differentiate between qualified and non-qualified members of the industry.

Dr. Dunstan on "Fluid Fuels"

The object of the meeting on September 24 was to hear a paper on "Fluid Fuels," by Dr. A. E. Dunstan, chief chemist to the Anglo-Persian Oil Co., who went over a considerable amount of familiar ground in describing the production, refining, and utilisation of liquid fuels. Dealing with the important developments that are taking place in the direction of increasing supplies of motor fuel, it was pointed out that no less than 30 per cent. of the American gasolene output in 1925 was produced from heavy oils by cracking. This represented a production of 2,824 million gallons of cracked gasolene during the year and on the basis of the estimated yield of gasolene by straight distillation—23·4 per cent. of the crude—it would have required approximately 297 million barrels of crude oil to furnish the gasolene made by cracking processes.

It was interesting to know, said Dr. Dunstan, that cracking was employed 60 years ago in the Bathgate Works in Midlothian for breaking down heavy oils into kerosene and that fundamental work by Dewar, Redwood, Thorpe, and Young in Great Britain had laid the foundation of the gigantic development that is taking place in the United States. There was a time when cracked spirit was regarded as distinctly inferior to a straight run material, but it had a somewhat higher anti-detonation value than the natural gasolene obtained from the same crude, and therefore at the moment cracked spirit should be regarded as definitely superior to straight run spirit when properly and adequately refined.

Oil from Coal

Finally the paper dealt with the obtaining of oils from coal and pointed out that the potential production of benzol in this country was about 40 million gallons per year and in America 80 million gallons per year. Whilst this was a very small proportion of the total motor fuel marketed to-day, the benzol produced was of great value for blending with straight run gasolene.

In a reference to low temperature carbonisation processes it was stated that despite more than a decade of intensive investigation into low temperature methods, no single process of treating British coals was yet proved on the large commercial scale, and, furthermore, the products of the operation, namely, semi-coke, primary tar, and gas, had been produced in relatively small quantities and the values assigned to them might require very drastic revision. The tar itself, it was pointed out, was peculiar in that it contained a considerable amount of tar acids, and these bodies had only a limited market. The motor spirit obtained from the tar and from stripping of the gas was an asset of considerable importance, and the most promising line of attack was the cracking of the middle oils. By topping the original crude, by stripping the gas, and by cracking the intermediate oil there might be obtained something like 6 gallons of crude spirit per ton of coal carbonised. Attempts had been made to treat the primary tars as though they were mineral oils, but it could not be too strongly emphasised that the nature of primary tar was absolutely different from that of petroleum, and therefore low temperature tar must be treated as an individual and not as a member of the family loosely referred to as mineral oils, and probably the most effective line of attack was that of cracking. If by waving some political wand the combustion of house coal could be prohibited and the 35 million tons replaced by the carbonised product of 50 million tons, 200 or 300 million gallons of gasolene would become available.

Bergius and Fischer Methods

Of all the methods proposed for converting solid fuel into liquid, that of Bergius stood out as a monument of laboratory research and brilliant engineering practice; but after many years of intensive effort the process had yet to justify itself commercially. While it was premature to state that the difficulties of dealing with vast quantities of raw material under tremendous pressures in continuously operated fool-proof plant were insurmountable, the fact remained that Bergius had pointed the way to a more complete liquefaction of coal substance than had hitherto been deemed practicable. The oil thus obtained might fairly be described as a primary tar, not so dissimilar from low temperature tar as from petroleum. Consequently a new technique was required to handle this material, and it was more than likely that, were Bergius oil produced in large amounts, cracking would be the likeliest avenue of approach. Although the Bergius process had chiefly attracted public attention by virtue of its application to coal, it should not be forgotten that the same procedure might be applied much more readily to the treatment of heavy petroleum residues, which on reduction yielded lighter oils, in fact the process might be regarded as one of cracking and simultaneous hydrogenation.

Almost contemporaneously with the work of Bergius came the development of liquid products, not directly from coal but indirectly by way of water gas. In effect Fischer, his collaborators, and other investigators on the Continent, had shown that the passage of water gas over a great variety of catalysts resulted in the formation of a complex mixture of alcohols and other bodies of the paraffin series which might be used as a motor fuel. It was stated that steps were being taken to put on the market very considerable quantities of his synthetic spirit. Work was being vigorously prosecuted both in Germany and France on this line of attack, and it did not seem unlikely that coal and its congeners might in future supply vast quantities of oils for internal combustion engines. One might visualise coal carbonised at a low temperature producing primary tar and coke. The primary tar would be treated to obtain gasolene, and the coke gasified into water gas might yield synthol. In this way a coal-producing country might reasonably anticipate the time when natural mineral oil was no longer its sole source of liquid fuel.

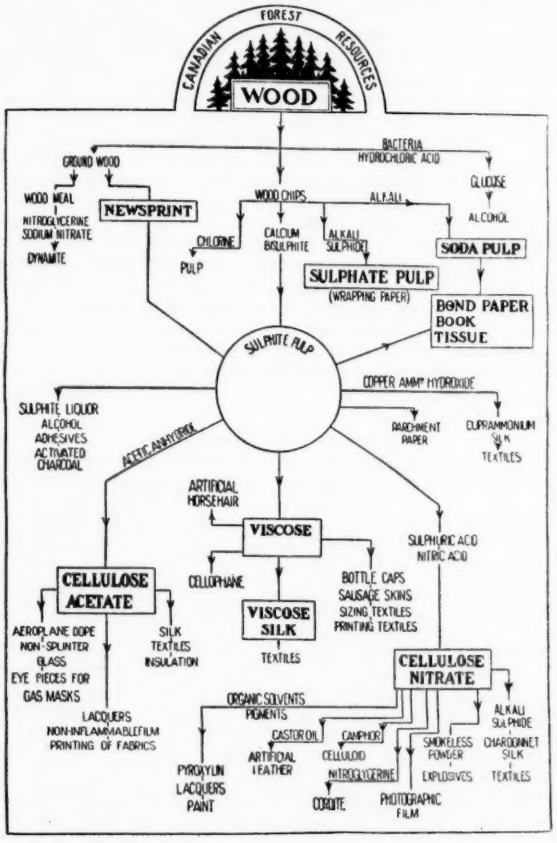
In the course of a short discussion Mr. A. Spyer (chief of Babcock and Wilcox, Marine Department) and others emphasised the importance of the production of fluid fuel from coal by carbonisation and other means.

Leather and Gelatin Chemistry

THE Division of Leather and Gelatin Chemistry of the American Chemical Society, at the Jubilee meeting of the latter in Philadelphia last week, discussed the following papers: "Influence of Hydrogen Ion Concentration and Valency of Added Anion on Plumping in Tar Liquors," by R. O. Page and J. A. Gilman; "The Extraction of Tanning Materials Using a Modified Teas' Extractor," by H. E. Williams; "The Influence of Temperature on Vegetable Tanning," and "Hydrolysis of Hide Powder by Saturated Salt Solutions," by A. W. Thomas; "Effect of Relative Humidity on the Destruction of Leather by Acid," by J. A. Wilson and E. Kern; "A Maximum Reactivity of Collagen in its Isoelectric Zone," "The Behaviour of Formaldehyde Tanned Hide Powder Towards Chromium Compounds," and "The Action of Neutral Chlorides Upon the Tanning Property of Chromic Chlorides," by K. H. Gustavson; "Effect of Temperature on Bating," "Action of Ammonia on Calf Skin," and "Extraction of Calf Skin by Salt," by H. B. Merrill; "Hydrolysis of Hide Powder by Saturated Mixtures of Sodium Chloride and Sodium Sulphate" and "Hydrolysis of Hide Powder by Saturated Solutions of Calcium Hydroxide," by M. W. Kelly; "Some Viscosity Measurements of Gelatin," by M. Briefer and J. H. Cohen; "The Behaviour of Deaminised Gelatin," by Z. C. Loebel; and "Water-Resistant Animal Glue," by F. L. Browne, and C. E. Hrubesky.

Sulphite Pulp and Its Uses

THE following chart showing the importance as raw material of the Canadian conifers is the work of Dr. Harold Hibbert, Professor of Cellulose Chemistry, of McGill University. It shows very clearly the classes of paper made from the various wood pulps, and how the principal descriptions of artificial



silk are produced from sulphite pulp. It has been claimed that more than 50 per cent. of the world's production of viscose is made from Canadian pulp. Cellulose nitrate has lost some of its importance in the artificial silk field, but the chart shows the multifarious uses to which it is put.

Analysis of Fertilisers

IN his report for the last quarter, Mr. F. W. F. Arnaud, the Kent County Analyst, states that 169 samples of fertilisers and feeding-stuffs were submitted for analysis. Of the 160 fertilisers examined, 115 were sold with a guarantee, and of these no fewer than 59 were found to be unsatisfactory. This percentage, though high, has been exceeded. A lime sample was found to contain a considerable quantity of silicate of lime. It was of interest to note that a higher percentage of fertilisers, other than shoddy samples, were found to be unsatisfactory than of guaranteed shoddies. Much of the shoddy sold during the quarter was comparatively low-grade shoddy, and some consignments contained large quantities of dirt. Feather wastes were of fairly good quality, while of the ten fur waste samples which were examined only two could be considered as high quality. The horn and hoof meals submitted were clean and dry, and the ammonia content high. A considerable amount of raw Peruvian guano was sold during the quarter, and it was found that consignments were somewhat poorer in fertiliser constituents than was guaranteed by the importers. A large proportion of the samples were below guarantee. The hop manures examined were of satisfactory composition, while a fertiliser was found to contain somewhat more potash than was guaranteed, but only 9·2 per cent. of ammonia and 22·5 per cent. phosphates.

Salaries of Chemists

To the Editor of THE CHEMICAL AGE.

SIR,—For some months past many contributors have been discussing in your journal the need of efficiency in the chemical laboratory. Some have complained of the lack of cohesion among chemists; others have expressed the view that registration may solve many problems. Strange to say, none of your contributors appear to realise that brains in the laboratory are, like any other commodity, bought in an open market, and, on occasions, in the cheapest market.

In your Journal of September 25, the following post was advertised:—

SITUATION VACANT.

Wanted for Shift Work (8 hours) in steel works laboratory, Chemist. Salary £2 10s. per week. Permanent post if suitable.—Apply, giving age, training and experience, Box No. 806, THE CHEMICAL AGE, Bouverie House, Fleet Street, E.C.4.

That any firm should dare publicly to advertise such a vacancy at 50s. per week—seeking a trained man probably with a degree of some sort, and offering wages less than some firms pay their labourers, who are not expected to think, but do as they are told—should cause works chemists to do some serious thinking about their economic interests.

That there may be men and women engaged in chemical laboratories who are more interested in research than in the financial returns attached to their labours is probable, but the majority of men and women so engaged have spent large sums of money and much time and study to fit themselves to earn salaries that will keep themselves and their dependents decently. To those I have no hesitation in saying that registration of chemists alone will not solve the vital problem of salaries and conditions.

Chemists and druggists have enjoyed registration for years by the Pharmaceutical Society—a registration and at the same time a restriction maintained by law—but salaries and working conditions of these men and women did not show any upward tendency until an economic organisation was created.

During the past eight years works chemists have been entering this organisation, and find themselves protected by agreements with firms against vacancies of this sort and receive at the same time, according to position and work, minimum salaries of anything from 85s. per week to £400 per annum, to say nothing of holidays (21 days per year), overtime rates, and decent working conditions.—Yours, etc.,

ARTHUR J. GILLIAN,
General Secretary of the National Union of Drug and Chemical Workers.

149, Newington Causeway, S.E.1.

To the Editor of THE CHEMICAL AGE.

SIR,—I notice in your issue of September 25 an advertisement for a shift chemist for employment in a steel works laboratory at a salary of £2 10s. per week, and in connection therewith would like to draw the attention of your readers to the following information.

The standard rate for *unskilled* labourers in the chemical industry is 12·64d. per hour, or 49s. 6d. for 47 hours, less, of course, insurance, leaving 48s. 2d. net. The rate for process shift work is 9s. 5d. per 8-hour shift, with overtime pay for week-end work.

The salary offered above, assuming only six shifts per week, works out at 8s. 4d. per shift, and for this princely remuneration the post has a prospect of permanency, and applicants are asked to supply details of training and experience!—Yours etc.

X. Y.

Sept. 28, 1926.

Limitations of Synthetic Fuel

IN a recent statement on the coal situation Professor Bergius uttered a warning against hoping for the alleviation of the present coal crisis by the employment of the Bergin method on a grand scale. He said it was useless to hope that the distillation of coal of inferior quality might lead to a renewed lease of life in the case of unremunerative mines that had had to be closed down. No improvement of the present situation on the world coal market was to be looked for as a result of chemical methods.

A Positive Infinitely Variable Gear

Possibilities in the Chemical Industries

A VERY old and hitherto unsolved problem in power transmission is the design of a positive drive infinitely variable gear so that, by the simple operation of a handle or valve, any alteration in speed can instantly be given to a driven shaft from a driving shaft. This would supersede the present complicated gear box, which is positive but only allows of a few definite speeds, of which the motor car change gear is a familiar example. At the same time all kinds of non-positive cone pulley devices with slipping belts at comparatively long centres would be rendered obsolete, and the same of course would apply to non-positive step pulleys. The matter is of particular importance to the chemical industries because accuracy of speed control in any machine, including mechanically-driven feed apparatus for solids, liquids, or gases, would be obtained in a manner hitherto regarded as impossible, just as in the electric driving of chemical works A.C. motors could be used to give a wide range of variation in shaft drive.

It is claimed that the problem has now been solved by the perfection of the "P.I.V." (Positive Infinitely Variable) gear, a British invention, which has been patented in over 40 different countries, the main British patents having been granted in 1925, while very satisfactory tests have been carried out upon it by the National Physical Laboratory. The control is in the hands of the P.I.V. Gear Syndicate, Ltd., 7, Princes Street, Westminster, London, S.W.1, and practically every industry using power is interested in a gear of this description especially including carbonisation, textiles, biscuit and bread making, printing, machine tools and marine work, to mention a few cases only.

The essential principle of the "P.I.V." gear consists in the use of a very short driving chain of special construction, if necessary at only a few inches centre, running between two expanding pulleys of the opposed conical disc type, one on each shaft, having inner faces sloping down to the shaft at an angle of about 30°. The surface of these pulleys has alternate ribs and grooves or channels radiating to the centre, which are broader at the periphery and narrower at the hub, and the chain is engaged at the edges by these ribs, which are essentially teeth. In this way a positive drive is obtained, just as much as with an ordinary roller chain and sprocket wheel.

The "P.I.V." chain is built up of links having a longitudinal slot punched through and containing a sleeve or casing carrying a pack of transverse small steel plates or slats pressed closely together vertically but loose in the sense that they can move in a direction at right angles to the travel of the chain. These project at either side and as a link enters the "V" between the pulleys the ribs or teeth of one pulley face push the requisite number of slats across into the spaces between the ribs on the opposite pulley face, the two halves of the pulley being so designed that a rib and a groove must always be opposite one another.

In order to alter the speed ratio all that is necessary is to slide the two halves of each of the expanding pulleys along the shafts and alter to a very slight extent the distance between them. When the two halves are brought closer together the chain, being always of a standard width across the slats, has to rise automatically in the grooves, giving the same effect as a pulley of large diameter, while the other expanding pulley on being widened out causes the chain to sink in the grooves, that is to say equivalent to a smaller diameter so that the speed alteration is infinite and instantaneous, as well as smooth and silent in action. Also the whole device can be contained without difficulty in a small gear box totally enclosed so as to be impervious to chemical fumes, dust, steam, or any other deleterious influence.

The National Physical Laboratory tests were carried out at full and zero load at maximum speed, and with spring shoe removed both at normal and tight stretch, while the subjects of overload and breakdown were also investigated. As indicated the tests are very satisfactory. A 5 h.p. "P.I.V." gear box, for example, with driving shaft at 750 revs. per minute with infinite variation of the driven shaft between 375 and 1,500 revolutions per minute showed 91 per cent. transmission efficiency at 375 revolutions and 87 per cent. at 1,500 revolutions, with 95 per cent. at 750 revolutions (equal speeds).

Action of Sugar on Cement

By Antony Seton

IT is not commonly appreciated that sugar has a most deleterious effect on cement, and among those who are aware of the undesirability of such an adulterant the exact extent of the harm done is by no means understood, and is generally underestimated. It is only when some serious failure such as that which occurred recently at Copenhagen (reported in THE CHEMICAL AGE on September 4) becomes apparent that interest is aroused in the question. It may be taken that sugar has no action on the aggregate with which concrete is made, and the disruptive effect of the sugar is confined to the cement alone.

An average Portland cement contains some 62 per cent. of calcium oxide in combination as silicate and aluminate, and very little free lime. If the raw materials have been ground insufficiently or the firing has not been taken to a sufficiently high temperature a large proportion of the lime will remain uncombined and in a very reactive state. The presence of much free lime is detrimental in any case, leading to the early disintegration of the cement, but it is especially harmful if there is any contamination with sugar. Lime dissolves in an aqueous solution of sugar to form a saccharate which is very soluble in water. It is therefore obvious that the presence of sugar in the water used for mixing or in the cement itself is highly deleterious.

Quantitative Experiments

In some experiments that were carried out in the endeavour to secure quantitative results some interesting figures were obtained. An ordinary cement was used which gave a final setting time of 8¼ hours when tested in the usual manner with the standard Vicat needle. When a 7½ per cent. solution of sugar was used instead of water the final set was under 45 minutes. Briquettes were made up for the tensile test with a 20 per cent. solution, and some broke on placing in water after 24 hours in the air in the moulds in a damp atmosphere. Others survived immersion, but none for more than six days. A further series kept in the air cracked after exposure for eight weeks. Briquettes made with a 1¼ per cent. solution lasted for some months, but all cracked eventually. The le Chatelier tests showed the tremendous expansion that a very small quantity of sugar will produce. The original cement had an expansion of 2·5 millimetres, which the use of a 1¼ per cent. solution of sugar increased to 15·5 millimetres. The result of such an expansion in a reinforced concrete cantilever or pile can be imagined. The experiments led to the following conclusions :—(i) The setting time of an ordinary cement is greatly reduced by the presence of sugar; (ii) the tensile strength is also reduced, and immersion in water accentuates the weakness; (ii) the expansion shown by the le Chatelier test becomes too large to permit the use of cement.

The work as carried out had reference to new cement only, and further investigation is necessary to determine the effect of sugar on concrete that has set. It would appear that as the free lime has become hydrated and carbonated and to some extent has combined with the silica available there should be very little action. It is understood that there are reinforced concrete tanks in use for containing wines that have not failed to give satisfaction. Whether this is due to the formation of insoluble calcium salts such as the tartrate, or whether fructose has a different action from sucrose has not been decided, but in view of the known insolubility and hardness of calcium tartrate it is probable that the skin formed makes a protective coating which the sugar cannot penetrate.

Dyers' Prices Revised

IT is reported in Manchester that dyers of cotton yarns and piece goods have revised their price lists, and that in certain qualities concessions are made to customers. The lists are complicated, and the reductions irregular, but it is understood that the charges for dyed poplins have been reduced. Future prices for manufactured goods are dependent upon an early termination of the coal dispute. A case was reported in Manchester on Wednesday of a firm who are now asked 70s. a ton for coal, having arranged a substantial contract for delivery after the pits are generally reopened at 16s. a ton, or less than was paid before the stoppage.

Dermatitis Contracted from Soda

In the Shoreditch County Court, on Tuesday, before Judge Cluer, Henry Robert Wright, of 40, Norman Road, Old Ford Road, London, was the applicant in an application under the Workmen's Compensation Act, the respondents being J. Manger and Son, Ltd., salt and soda manufacturers, of 57, High Street, Kingsland. From the applicant's statement of claim it appeared that he had been working for the respondents at the Victoria Soda Works, in Rosebank Road, Bow, when he was certified by the certifying surgeon to be suffering from dermatitis on November 13, 1925. He was paid compensation up to date, and to settle the claim the respondents were now offering £100.

Mr. Wort, for the respondents, said that the amount agreed upon was £100, and £9 9s. costs, but when the offer came before the Registrar it was refused on the ground of inadequacy. The workman had been certified as suffering from dermatitis, and since his average weekly earnings amounted to £3 13s. 4d., he was paid the maximum amount of compensation for total incapacity, since November 13, 1925. The applicant was a labourer, and the respondents were salt and soda manufacturers. The applicant could not be taken back into his old employment, as he should not engage in any kind of employment where there was any kind of irritant, such as salt or soda. They were offering him a year and three months compensation.

The judge said he would approve the settlement if the applicant was cured in two months.

New Sugar Beet Factory

Shropshire farmers are reported to have received a definite intimation that, provided 8,000 acres of sugar beet are guaranteed by December 15, a sugar beet factory will be erected between Shrewsbury and Wellington, at a cost of about £260,000. This would be completed by October, 1927, in readiness for next year's crop. The company at the back of this is said to be a new one, registered under the title of the Hygienic Sugars, Ltd., whose registered offices will be in Shrewsbury. More than half the capital will be British, the remainder coming from the Continent, and there will be local directors. The project will have the practical backing of Continental experts. Dr. Wenzell, a recognised expert on sugar beet factories, will design the factory, and 75 per cent. of the machinery to be installed will be made in England. It is estimated that it will take ten months to build the factory; that the contractors will require 300 men to work daily on the factory site during the period of construction; the machinery, etc., will necessitate the employment of over 1,600 men for at least six months; and when the factory begins operations seventy skilled artisans will be employed, as well as an equal number of unskilled labourers. In addition to this, the organised growing of sugar beet will necessitate the employment of over 1,000 permanent agricultural workers as well as a large number of casual labourers.

Dr. Rideal on Catalysis

At the first meeting of the 1926–27 session of the London Section of the Society of Chemical Industry, at Burlington House, Piccadilly, in the rooms of the Chemical Society, on October 4, at 8 p.m., Dr. E. K. Rideal will read a paper on "Recent Advances in Catalysis." The application of catalytic methods to the simpler products of coal represents one of the most important advances in industrial contact catalytic methods of recent years. There are various problems in this field which still await solution, such as the selection or fractional combustion of hydrocarbons and the condensation of the lower saturated hydrocarbons. In pure research advances are being made in mapping out the areas of various properties on the surfaces of catalysts. The effectiveness of even a good technical catalyst is still surprisingly low. Some light is now shed on the specific effects of promoters. In homogeneous catalysis a study of the inhibition of autoxidation and polymerisation of varnish and paint vehicles and anti-knock compounds in gas mixtures has opened up a new vista of pure research. Experiments on the transfer of energy on collision from photo- or electron-excited molecules to ordinary molecules is suggestive of developments in a technical direction.

Oil from Pit Waste Products

An invention which, he said, might bring about a revolution in the coal industry, was announced by Sir Samuel Chapman, M.P., at a meeting of his constituents in South Edinburgh on Saturday, September 25. At most British collieries large quantities of waste materials were produced. The colliery-owner had to bring that waste up to the surface. These materials, however, could almost without exception be made profitable if the necessary plant was installed. The poorest materials would yield about 18 gallons of oil to the ton and from 3,000 to 4,000 cubic feet of gas. The richer materials would yield anything from 30 to 50 gallons of oil per ton and as much gas as the poorer materials. The crude oil produced from those otherwise waste materials were of first-rate quality. They yielded a first-class motor spirit which would compare more than favourably, from a motorist's point of view, with any imported motor spirit from America or Russia. Sir Samuel exhibited specimens of waste coals and of the oil products obtained therefrom. The petrol oil which he exhibited, he said, had been thoroughly tested and had been pronounced by the greatest distributors of oil in the world as being equal, if not superior, to any oil produced from the natural oilfields. A plant was being erected within a stone's-throw of the municipal boundaries of Edinburgh. The inventor was a Midlothian man.

Research at the Institute of Brewing

Report V of the Institute of Brewing Research Scheme gives an account of the research work of the institute from April 30, 1924, to April 30, 1926. Among the investigations of chemical interest may be mentioned the work which is being directed by Professor F. L. Pyman, F.R.S., at the College of Technology, Manchester, on the isolation and identification of the constituents of the hop on which its preservative and antiseptic properties depend. Six reports on this investigation have been published in the *Journal of the Institute of Brewing*, of which report V gave details of the work in progress for the determination of "The Chemical Constitution of Lupulon." Professor S. B. Schryver, at the Imperial College of Science and Technology, London, is directing research on the keeping properties of yeast. The effect of hydrogen ion concentration on various brewing processes is being investigated at the breweries of Joshua Tetley and Son, Ltd., Leeds, and William Younger and Co., Ltd., Edinburgh, and Mr. G. Hagues has published two reports on the subject in the journal of the institute.

Paint Research Association Registered

The Research Association of British Paint, Colour, and Varnish Manufacturers was registered on September 23 as a company limited by guarantee, and not having a capital divided into shares, with 300 members, each liable for £5 in the event of winding up. The word "limited" is omitted from the title by licence of the Board of Trade. The objects are to promote research and other scientific work in connection with the paint, colour, and varnish and allied industries, to establish and maintain laboratories, workshops or factories, to carry on experiments, to collaborate with owners of paint, colour, and varnish factories, being members of the association, to print, publish, acquire and circulate books, papers, periodicals, and other literary undertakings treating of or bearing upon the said industries, etc. The management is vested in a council. The file number is 216,387.

Publishing Amalgamation

Readers of The Chemical Age will be interested to hear of a big amalgamation announced this week. Ernest Benn, Ltd., has acquired the whole of the capital of T. Fisher Unwin, Ltd., and has thus brought about the biggest publishing merger of recent times. The matter was only settled and the announcement made as we go to press, so that details are not forthcoming, but it is stated that Mr. T. Fisher Unwin and Mr. A. D. Marks, governing director and managing director respectively of T. Fisher Unwin, Ltd., will join the Board of Ernest Benn, Ltd. Thus Ernest Benn, Ltd., adds to its unrivalled list of technical books which serve the chemical industry and to a general publishing list probably unique for its interest and diversity.

From Week to Week

NINE CHILDREN WERE INJURED recently through the ignition of a block of calcium carbide which had been dropped down a grid in a Liverpool street.

THE PROMPT APPLICATION OF CHEMICALS recently extinguished a blaze when a quantity of tar was spilt through the upsetting of a tar kettle at Middlesbrough.

COLONEL SIR EDWARD ALLAN BROTHERTON, Bart., is among a number of eminent men upon whom the Freedom of Leeds will be conferred at the Town Hall on October 6.

A FIRE OCCURRED at the premises of the Wearside Refinery Co., at Sunderland, on Thursday, September 23. The factory contained large quantities of grease, and considerable damage was done.

MR. WILLIAM HALL, foreman dyer, has received presentations from his fellow-workers in the employment of John Turnbull and Sons, Ltd., dyers, of Hawick, on his retirement after 57 years' service.

SIR HUGH AND LADY BELL have been presented with a cheque for £842 16s. 9d., a fund raised to commemorate their golden wedding. The money will be used to support Lady Bell's Winter Garden, in Middlesbrough.

SIR JOSEPH J. THOMSON, of Cambridge, is to open the new science buildings of the University College of North Wales at Bangor, provided out of the North Wales Heroes Memorial Fund, at a cost of £90,000, on November 2.

LEVER BROTHERS entertained members of the North-Western Section of the Institute of Transport on Friday, September 24, when 80 transport firms' representatives inspected the soap works and the dock which the company is building at Bromborough Pool.

SIR MAX MUSPRATT, President of the Federation of British Industries and Chairman of the United Alkali Co., has been appointed a member of the Mersey Docks and Harbour Board in succession to the late Sir Francis Dawson, who was a nominee member of that body.

RECENT WILLS INCLUDE: Mr. Henry Clement, of Swansea, secretary of the Welsh Plate and Steel Manufacturers' Association, £11,529.—Mr. Charles Storey Gilman, of Northwood, chairman of Allen-Liversidge, Ltd., and for some years a director of the Phœnix Chemical Co., Ltd., and other companies, £98,268.

F. W. HAMPSHIRE AND CO., LTD., manufacturing chemists, of Riverside Works, Derby, have decided to remove the whole of their plant to new premises to be erected in the vicinity of Sinfinlane. The firm has two factories employing 200 people, and there is a possibility of this number being increased when the new premises are completed.

PROFESSOR J. W. MCBAIN, Leverhulme Professor of Physical Chemistry, who for twenty years has been on the staff of University College and the University of Bristol, has accepted an appointment at Stanford University, California, where he will take up his duties after Christmas of this year. Miss M. E. Laing and Miss M. H. Norris have also been appointed to the staff of Stanford University.

THE FOLLOWING APPOINTMENTS for session 1926–27 have been made at University College, London:—Mr. A. Hemingway, M.Sc., M.B., senior assistant in the department of biochemistry and physiology, and Mr. G. F. Marrian, B.Sc., and Mr. H. J. Channon, M.Sc., assistants in the same department; Mr. H. W. P. Richard, B.Sc., and Miss L. M. Pickford, M.Sc., assistants in the history and method of science.

THE FIRST MEETING of the Session 1926–27 of the London Section of the Society of Chemical Industry will be held at Burlington House, Piccadilly, W.1, in the rooms of the Chemical Society, on Monday, October 4, at 8 p.m., when a paper on "Recent Advances in Catalysis," will be read by Dr. E. K. Rideal. By the courtesy of the Committee of the Chemical Industry Club, members of the Section may dine at the club before the meeting (dinner 3s. 3d.).

THE GRASSELLI CHEMICAL CO., Cleveland, Ohio, has taken up the Holdworth pyrite claim at Hawk Junction, Canada. Diamond drilling is to be done. The Algoma Steel Corporation some eight years ago put down 22 holes on this property and a sulphur content of 40 to 50 per cent. was revealed in the pyrite bodies cut. There are several other pyrite properties in the section. Under previous operations power was produced by steam. Electric energy is now available and this should reduce costs. Sulphur prices have strengthened materially of late.

THE ROYAL INSTITUTE OF PUBLIC HEALTH announces that a course of lectures on "Problems of Personal and Public Health" will be delivered in the Lecture Hall of the Institute, 37, Russell Square, London, on Wednesday of each week during the period October 13 to December 8, inclusive, at 4 p.m. The Harben Lectures on "Quantitative Experiments in the Study of Infection and Resistance," by Professor W. W. C. Topley, M.A., of the University of Manchester, have been arranged for November 15, 18 and 22, at 4 p.m., in the Lecture Hall of the Institute, to which all men and women interested in medico-sociological problems are cordially invited.

MR. JOHN WILKINSON (Nottingham) has been elected president of the Institution of Gas Engineers, and Mr. John W. McLusky (Glasgow) vice-president.

SIR FREDERICK G. HOPKINS, Professor of Biochemistry in the University of Cambridge, has been appointed a member of the Medical Research Council.

THE INTERNATIONAL Union of Pure and Applied Chemistry, at its meeting in Washington, U.S.A., decided to re-admit German chemists into its membership.

DR. J. H. SIMONS, head of the department of chemistry in the University of Porto Rico, has been appointed professor of chemistry in the Northwestern University, Chicago.

MR. H. O. WELLER, who established the Building Research Station under the Department of Scientific and Industrial Research, will sail this week for Kenya as Supervisor of Technical Education.

MR. OTTO HOERNING and Mr. Belilowsky, of the firm of Hoerning Brothers, Rossleben, Saxony, have arrived in England to arrange, it is believed, for Anglo-German co-operation in the beet sugar industry.

MR. A. G. BELL, a former Director of Public Works in Trinidad and now a member of the senior staff of the Anglo-Persian Oil Company, has arrived in Trinidad for a stay of a month or six weeks in connection with the company's interests there.

SIR SAMUEL CHAPMAN, M.P., in a recent address to his constituents in Edinburgh devoted part of his speech to what he described as a wonderful invention for the production of oil from waste coal, which he asserted might be of the utmost importance in the present coal crisis.

MR. E. G. C. NEEP, who has just been selected as the prospective Labour candidate for Middlesbrough West, was for three years employed as a works chemist by the British Cellulose Co., at Spondon, near Derby. Subsequently he acted as a teacher and a journalist, and was called to the Bar in 1923.

FOUR COLOGNE BUSINESS MEN, following the sentencing of an employee of the Leverkusen branch of the I. G. Farbenindustrie A.G., have been sentenced to various terms of imprisonment in Düsseldorf for being concerned in a scheme for selling chemical patents abroad, the property of the Leverkusen works.

AN AMALGAMATION is announced between two of Germany's oldest manufacturers of mineral colours, Gebrueder Heyl and Co., Berlin-Charlottenburg, and A. Behringer, G.m.b.H. It is expected that production costs will be lowered by the introduction of new processes and administrative economies.

SIR ALFRED MOND, Sir Hugo Hirst, the Marquis of Reading, and Mr. J. de Rothschild are joining the board of directors of the Palestine Electric Corporation, Ltd., which was formed for the purpose of carrying out Mr. Rutenburg's scheme for the electrification of Palestine. The capital has been fully subscribed.

APPLICATIONS ARE INVITED for the following appointments:—Research chemists for the Chemical Research Laboratory, Teddington, Middlesex. Good Honours Degree or equivalent and some research experience. £175–£15–£235 plus Civil Service bonus. The Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, Westminster, London, S.W.1.

DR. S. G. BARKER, Ph.D., D.I.C., A.Inst.P., for the past two years head of the Physics Department of the British Research Association for the Woollen and Worsted Industries, has been appointed to succeed Mr. Bliss, who has been in charge of the association's research work since its inception seven years ago. Dr. Barker was formerly engaged upon research work at Woolwich.

THE CHEMICAL SOCIETY will hold its first ordinary scientific meeting this session on Thursday, October 21, at 8 p.m. At the next subsequent meeting on October 28 the lecture founded in memory of the late Dr. Hugo Müller will be delivered in the lecture theatre of the Institution of Mechanical Engineers at 8 p.m., by Professor S. P. L. Sörensen, of Copenhagen, who has chosen as his subject: "The Composition and the Characterisation of Proteins."

MR. AND MRS. DUNCAN WATSON, of St. Helens, have just celebrated their golden wedding. Early in life Mr. Watson became connected with the chemical works of the late Mr. Duncan M'Kechnie at Runcorn, later becoming manager of the works opened by the firm at St. Helens, in 1871. He retired in 1921, after 50 years' service, the works having in the meantime been absorbed by the United Alkali Co., and was succeeded in the management by his son, Mr. Edwin Watson.

THE ROYAL SOCIETY, in a recent number of its Proceedings, published an interesting paper by Dr. R. A. Smith, dealing with adsorption. The paper was originally read to the Royal Society in 1863, but, on the advice of the referee, only a summary of the manuscript was published, the manuscript proper being consigned to the archives. Mr. S. Lenher recently suggested that the paper was of such historical importance, in its prophetic insight into adsorption phenomena, that the publication of a considerable part of the paper was now warranted. To this the council agreed, and the portions selected by Professor F. G. Donnan and Mr. Lenher are now published.

References to Current Literature

British

ANALYSIS.—The estimation of ferro- and ferri-cyanides. W. M. Cumming and W. Good. *Chem. Soc. Trans.*, August, 1926, pp. 1924–1928.

CRYSTAL STRUCTURE.—Crystal structure and chemical constitution of basic beryllium acetate and its homologues. G. T. Morgan and W. T. Astbury. *Roy. Soc. Proc.*, September, 1926, pp. 441–448.

The structure and isotrimorphism of the tervalent metallic acetylacetones. W. T. Astbury. *Roy. Soc. Proc.*, September, 1926, pp. 448–467.

Change of crystal structure of some salts when crystallised from silicic acid gel. The structure of silicic acid gel. H. A. Fells and J. B. Firth. *Roy. Soc. Proc.*, September, 1926, pp. 468–474.

DYESTUFFS.—The spectrophotometric examination of dyes and indicators. Part II. Types of absorption curves, determination of P_H and recognition of dyes. E. B. R. Prideaux. *J.S.C.I.*, September 17, 1926, pp. 678–682.

GENERAL.—The liability to explosion of carburetted atmospheres in petroleum and distillate storage tanks. A. Williams-Gardner. *J. Inst. Petroleum Tech.*, June, 1926, pp. 336–340.

Thermometry. W. F. Higgins. *J. Roy. Soc. Arts*; Part I, September 3, 1926, pp. 946–959; Part II, September 10, 1926, pp. 962–976.

HYDRATION.—Synthesis of certain higher aliphatic compounds. Part II. The hydration of stearolic acid. G. M. Robinson and R. Robinson. *Chem. Soc. Trans.*, August, 1926, pp. 2204–2209.

REACTIONS.—The action of thionyl chloride on hydroxyanthraquinones. Part III. A. Green. *Chem. Soc. Trans.*, August, 1926, pp. 2198–2204.

Piperitone. Part VIII. The condensation of piperitone with aldehydes. J. C. Earl and J. Read. *Chem. Soc. Trans.*, August, 1926, pp. 2072–2076.

URETHANES.—Studies on the relationship between chemical constitution and physiological action. Part I. Position isomerism in relation to the miotic activity of some synthetic urethanes. E. Stedman. *Biochem. J.*, No. 4, 1926, pp. 719–734.

VALENCY.—Researches on residual affinity and co-ordination. Parts XXVII. and XXVIII. C. T. Morgan. *Chem. Soc. Trans.*, August, 1926, pp. 2018–2030.

WOOL.—The bleaching of wool with sulphur dioxide. A summary of the literature. E. F. H. Cook. *J. Text. Inst.*, August, 1926, pp. 371–378T.

The sulphur content of wool. Part I. J. Barritt and A. T. King. *J. Text Inst.*, August, 1926, pp. 386–395T.

United States

ACIDS.—Addition reactions of unsaturated α-ketonic acids. M. Reimer. *J. Amer. Chem. Soc.*, September, 1926, pp. 2454–2462.

Pectic acids. E. K. Nelson. *J. Amer. Chem. Soc.*, September, 1926, pp. 2412–2414.

ADSORPTION.—Adsorption from solution by ash-free adsorbent charcoals. Part II. E. J. Miller. *J. Phys. Chem.*, September, 1926, pp. 1162–1169.

Studies in adsorption. Part XV. M. R. Mehrotra and N. R. Dhar. *J. Phys. Chem.*, September, 1926, pp. 1185–1193.

COKE.—Selection of coals for coke manufacture. H. J. Rose. *Blast Furnace and Steel Plant*; Part I, August, 1926, pp. 344–349 and 366; Part II, September, 1926, pp. 390–395 and 409.

DIAZO COMPOUNDS.—Optically active diazo compounds. Part III. A crystalline, alicyclic diazo ester. F. E. Kendall and W. A. Noyes. *J. Amer. Chem. Soc.*, September, 1926, pp. 2404–2412.

GLASS.—Fifty years of glass-making. A. Silverman. *J. Ind. Eng. Chem.*, September, 1926, pp. 896–899.

LIME.—Effect of time and temperature of burning on the properties of lime. R. T. Haslam and E. C. Hermann. *J. Ind. Eng. Chem.*, September, 1926, pp. 960–963.

ORGANO METALLIC COMPOUNDS.—Organo-calcium iodides. H. Gilman and F. Schulze. *J. Amer. Chem. Soc.*, September, 1926, pp. 2463–2467.

Dicarboxy-phenylarsonic acids. Part I. C. S. Hamilton and R. Frazier. *J. Amer. Chem. Soc.*, September, 1926, pp. 2414–2416.

REACTIONS.—The effect of moisture and paraffin surface on the rate of reaction of nitric oxide and oxygen. R. L. Hasche. *J. Amer. Chem. Soc.*, September, 1926, pp. 2253–2259.

The condensation of mesityl oxide with aliphatic ketones. J. B. Ekeley and M. S. Carpenter. *J. Amer. Chem. Soc.*, September, 1926, pp. 2375–2378.

SILK.—The rôle of chemistry in the manufacture of silk. W. M. Scott. *J. Ind. Eng. Chem.*, September, 1926, pp. 924–926.

SOAP.—Progress in the soap industry during the last fifty years. M. H. Ittner. *J. Ind. Eng. Chem.*, September, 1926, pp. 908–910.

WATER.—Water supply and sewerage during the past fifty years. R. S. Weston. *J. Ind. Eng. Chem.*, September, 1926, pp. 899–901.

French

ACETALS.—The preparation of diethylacetal. G. Fouque and M. Cabanac. *Bull. Soc. Chim.*, August, 1926, pp. 1184–1186.

ACIDS.—The preparation of piperonylic acid from piperonal. E. Cattelain. *Bull. Soc. Chim.*, August, 1926, pp. 1186–1188.

ARTIFICIAL SILK.—The manufacture of artificial silk. Preparation of viscose. A. Guillaumin. *La Technique Moderne*, September 15, 1926, pp. 545–551.

GENERAL.—X-rays and long-chain organic compounds. Spectrographic investigations of their structure and orientation. M. Trillat. *Ann. Phys.*, July–August, 1926, pp. 5–101.

Thin films. Their structure and dimensions. J. J. Trillat. *Rev. Scient.*, September 11, 1926, pp. 522–528.

KETONES.—Investigation of natural methylheptenone. Part I. R. Escourrou. *Bull. Soc. Chim.*, August, 1926, pp. 1121–1138.

STEREO-CHEMISTRY.—Steric hindrance and cis-trans isomerism. Part III. Study of *o*-cyclohexyl-cyclohexanol. G. Vavon, M. Anziani, and M. Herynk. *Bull. Soc. Chim.*, August, 1926, pp. 1138–1147.

German

ANALYSIS.—The rapid titrimetric determination of large quantities of manganese in technical iron alloys. J. Heczko. *Z. anal. Chem.*, Vol. 68, No. 12, 1926, pp. 433–461.

The potentiometric estimation of aromatic nitroso- and nitro-bodies with titanium trichloride. E. Dachselt. *Z. anal. Chem.*, Vol. 68, No. 11, 1926, pp. 404–410.

Modified Brunck method for the estimation of sulphur in solid fuels. V. Schön and F. Vykypiel. *Chem.-Zeit.*, September 8, 1926, pp. 673–674.

A new iodometric estimation of chloride, and a determination of iodide, bromide and chloride in presence of cyanide. R. Berg. *Z. anal. Chem.*, Vol. 69, No. 1, 1926, pp. 1–15.

CATALYSIS.—The catalytic action of copper ions in hydrochloric acid evolution. J. Bodnar and L. E. Roth. *Z. angew. Chem.*, September 16, 1926, pp. 1101–1102.

The catalytic isomerisation of pinene. F. Richter and W. Wolff. *Ber.*, September 15, 1926, pp. 1733–1736.

The catalytic condensation of acetone at high temperatures and pressures. Part I. W. Ipatiew and A. D. Petrow. *Ber.*, September 15, 1926, pp. 2035–2038.

ELECTRO-CHEMISTRY.—Technical electro-osmotic processes. K. Illig. *Z. angew. Chem.*, September 16, 1926, pp. 1085–1093.

OILS.—On the composition and chemical constitution of lubricants (lubricating oils and their synthesis). A. Spilker. *Brennstoff-Chem.*, September 1, 1926, pp. 261–264.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

257,353. Anthraquinone Dyestuffs possessing Affinity for Acetyl Silk. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, W. H. Perkin, South Parks Road, Oxford, and C. Hollins, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, June 4, 1925.

An anthraquinone derivative containing a primary amine group is condensed with a reactive anthraquinone derivative, viz., α-amino-anthraquinone, α-diamino-anthraquinones, and their simple derivatives such as diamino-anthrarufin and diamino-chrysazin in presence of calcium chloride or iodine as condensing agent. The first component may be α- or β-amino-anthraquinone, or derivatives such as 1-amino-2-methyl-anthraquinone. The only reactive anthraquinones found are those specified above. The products are not vat dyestuffs but have good affinity for cellulose acetate when dyed direct from suspension in water; they are probably anthraquinonyl-iminoanthrones.

257,361. Arsenic Compounds of the Aromatic Series. A. J. Ransford, London. From L. Cassella and Co. G.m.b.H., Frankfort-on-Main, Germany. Application date, June 9, 1925.

These compounds, which have therapeutic properties, are obtained by gently reducing a benzoxazolone arsinic acid (see specifications 214,628 and 240,969, The Chemical Age, Vol. X, p. 681, and Vol. XIII, p. 500). Several examples are given in which benzoxazolone arsinic acids are dissolved in hydrochloric acid, treated with potassium iodide and then with sulphur dioxide, and the precipitate washed and purified.

257,372. Dry Liquefied Gases, Production of. J. Y. Johnson, London. From Badische Anilin und Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, June 22, 1925.

The object is to remove the last traces of moisture from gases which are to be liquefied, and thus to avoid the formation of ice in the pipes of the liquefying apparatus. The gas is dried by the usual methods, compressed, and then brought into contact with a highly porous inorganic adsorbent such as silica gel, or natural or artificial zeolites. Chemical absorbents such as calcium chloride are not suitable. Regeneration of the adsorbent is effected by passing dry gases, at or above atmospheric pressure, through it. The dry gas may be that employed in the liquefaction, and it may be employed at the temperature of pre-cooling.

257,418. Tetrazoles, Production of. K. F. Schmidt, 43, Bergstrasse, Heidelberg, Germany. Application date, September 21, 1925. Addition to 252,460.

Specification 252,460 (see The Chemical Age, Vol. XV, p. 12) describes the production of amines, substitution products, and nitriles by treating aromatic hydrocarbons or organic carbonyl compounds with hydrazoic acid in the presence of a mineral acid. The substances were employed in molecular proportions, and compounds having one nitrogen atom only were obtained. It is now found that by employing a larger proportion of hydrazoic acid, a further molecule N_3H condenses with the carbonyl compound without splitting off N_2, so as to form tetrazoles. Examples are given of the condensation of hydrazoic acid with cyclohexanone, acetone, and benzophenone.

257,434. Hydrogen, Manufacture of. J. H. Beaumont, London. From Metal Research Corporation, 31, Nassau Street, New York. Application date, October 14, 1925.

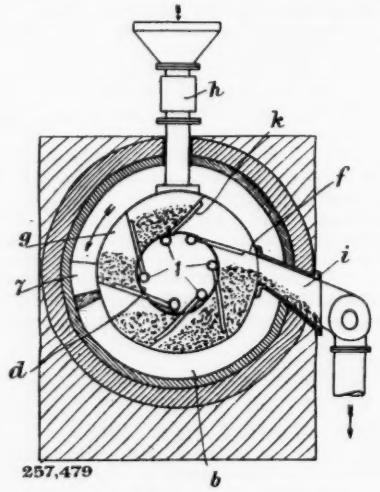
Ferric oxide, FeO, is treated with producer gas to reduce it to iron, which is then treated with steam to re-oxidise it and liberate hydrogen. The temperature at which the iron oxide is reduced is below 600° C., so that the iron obtained is very active. During reoxidation, the temperature is kept below 700° C. to minimise the formation of magnetic oxide. The use of ferric oxide involves less reducing gas than if higher oxides of iron are used.

257,470. Chromates, Manufacture of. W. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Uerdingen, Germany. Application date, December 17, 1925.

A mixture of chrome ore, sodium carbonate, and a solid diluent such as lime is spread in a thin layer and treated with hot oxidising gases without stirring or agitating. If the layer is only 2 cm. thick, the quantity of lime required is reduced, and the reaction is complete in one-half to one hour. Another layer of material is then added, and the process repeated. A yield of 98 per cent. can be obtained.

257,479. Revoluble Kilns for the Distillation of Bituminous Materials. E. Roser, 5, Marienplatz, Bochum, Germany. Application date, December 29, 1925.

This apparatus is of the rotary drum type. An inner cylinder *d* is rotatable and carries transverse annular partitions and also longitudinal partitions *f* which divide the space between the cylinders into compartments *g*. The raw material is supplied through shoots *h*, and remains in the compartments for about



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three-quarters of a revolution, until it is discharged through a shoot *i*. The gaseous products pass through pipes *k* into collecting channels *l* which discharge into a chamber at the end of the drum. Combustion gases from burners at the opposite end pass through the inner cylinder *d*, then into space *b*, and then back through this space in the opposite direction to the outlets 7. A labyrinth packing is provided at the end of the drum. Some modifications are described.

257,528. Pigment Colours, Production of. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 21, 1926.

Specification 181,584 (see The Chemical Age, Vol. VII, p. 91) describes the production of green pigment colours by treating nitroso-beta-naphthol or its bisulphite compound with ferric or ferrous salts in the presence or absence of substrates. It is now found that if these pigments are prepared in the presence of basic dyestuffs of the malachite green series, the shades are varied and the fastness increased. Turkey red oil or other dispersing agent may be added.

Note.—Abstracts of the following specifications which are now accepted appeared in The Chemical Age when they became open to inspection under the International Convention:—234,524 (D. C. Hare), relating to treating ores, see Vol. XIII, p. 15 (Metallurgical Section); 240,789 (International Nickel Co.), relating to separation of nickel and copper from mattes, see Vol. XIII, p. 47 (Metallurgical Section); 238,523 (Farbwerke vorm. Meister, Lucius, und Brüning), relating to vat dyestuffs of the anthracene series, see Vol. XIII,

p. 402 ; 248,404 (G. H. Dupont and G. Brus), relating to synthetic camphor, see Vol. XIV, p. 506 ; 252,690 (Metallbank und Metallurgische Ges., Akt.-Ges.), relating to production of lithium carbonate, see Vol. XV, p. 142.

International Specifications not yet Accepted

255,811. PYRIDINE DERIVATIVES. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler, 7, Weissfrauenstrasse, Frankfort-on-Main, Germany. International Convention date, July 22, 1925.

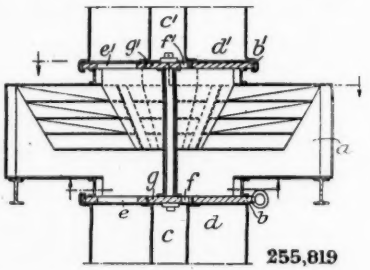
A 2-halogen-5-nitropyridine is treated with hydrazine hydrate with cooling, in the presence of a solvent such as water or alcohol, to obtain 2-hydrazino-5-nitropyridine.

255,818. HYDROCARBONS. F. Fischer, and H. Tropsch, 1, Kaiser-Wilhelm Platz, Mulheim-on-Ruhr, Germany. International Convention date, July 21, 1925.

Oxides of carbon and hydrogen react in the presence of a catalyst of zinc oxide and finely divided iron to produce methane only at 430° C. ; a mixture of methane 80 per cent. and homologues 20 per cent. at 380° C. ; and a mixture of methane 10 per cent. and other paraffin hydrocarbons 90 per cent. at 300° C. Some catalysts, *e.g.* nickel, produce only methane.

255,819. GAS ABSORPTION APPARATUS. Silica Gel Corporation, 239, Redwood Street, Baltimore, Md., U.S.A. (Assignees of F. B. Krull, 50, Steinbergstrasse, Tegel, Berlin.) International Convention date, July 27, 1925.

The casing *a* is divided into non-communicating sections containing the absorption medium, and there are two rotary valves each having two concentric portions *b*, *g*, and b^1, g^1, the



255,819

valves being operable separately or together. The parts *b*, b^1 have concentric slots *e*, e^1 connecting some of the sections with the inlet and outlet *d*, d^1 for the gas to be treated, and other ports *f*, f^1 in the inner portions of the valves connect some of the remaining sections with the inlet and outlet *c*, c^1 for the reactivating medium.

255,828-9. HYDROCARBONS, ALCOHOLS, ETC. Compagnie de Béthune, Bully-les-Mines, Pas-de-Calais, France. International Convention date, July 27, 1925.

255,828. Coal distillation gases comprising methane, hydrogen, and carbon monoxide are passed at 300°–600° C., and a pressure of 400 atmospheres over a ferric oxide catalyst, and then over activated carbon at 100°–400° C. The products include liquid hydrocarbons immiscible with water.

255,829. Methane or a gas containing it is passed at 200°–600° C. under pressure over iron or other oxide or the metals. Ethane, butane, and hydrocarbon oils are obtained.

255,837. POLYMERISED VINYL CHLORIDE. L. A. Van Dyk, 20, East 12th Street, New York. (Assignee of I. Ostromislensky, 435, Convent Avenue, New York.) International Convention date, July 21, 1925.

Gaseous vinyl chloride, or a solution in alcohol, methyl alcohol, monochlorbenzene, ethylene chloride or bromide, is exposed to ultra-violet light or sunlight. Unchanged vinyl chloride is volatilised, and the acetone-soluble polymer removed. Another polymer soluble in monochlorbenzene may then be extracted. If the polymerisation is prolonged polymers insoluble in acetone and monochlorbenzene are obtained. These may be heated with aniline or quinoline till they become soluble in monochlorbenzene. Films or shaped articles may be made from the solution.

255,839 and 255,861. ORGANO-ARSENIC COMPOUNDS. A. Binz and C. Räth, 42, Invalidenstrasse, Berlin. International Convention date, July 22, 1925.

255,839. An arsine, such as 3-amino-4-oxyphenylarsine, obtained by reducing 3-nitro-4-oxyphenylarsinic acid, is condensed with an arsenoxide or arsine halide, *e.g.*, 2-oxypyridine-5-dichlorarsine-hydrochloride. A condensing agent such as hypophosphorous acid may be used. Examples are given.

255,861. A mixture of an arsinic acid and an arsine in acid solution is reduced with sodium hypophosphite and potassium iodide. The products may be unsymmetrical and may contain substituted or unsubstituted aliphatic, aromatic, or heterocyclic nuclei, and are soluble in alkali. Mixtures such as 2-oxy-5-pyridinearsinic acid and 4-oxy-3-aminophenylarsine may be treated in this manner.

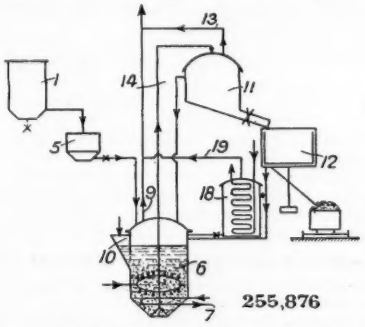
255,863-4. SILICA AND OTHER GELS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention dates, July 22 and 23, 1925.

255,863. A jelly such as silica, alumina, iron oxide, the product obtained by treating alkali silicate with a metal salt, etc., is rapidly dried at temperatures above 120° C. to obtain gels having small pores. The jelly may be dried by hot combustion gases, any tar in which is not detrimental. In an example, a silica hydrogel is made by treating sodium silicate with sulphuric acid. The sol is heated, and sets at 60°–90° C. to a jelly, which is broken up, washed with acidified water, and dried in air at 160° C.

255,864. A silicon compound is treated to form a precipitate instead of a sol, and this is pressed at 100 atmospheres pressure. A silicate solution can be treated with an acid, or silicon fluoride may be hydrolysed, etc., to obtain the precipitate. The precipitate is washed, but some acid is left in it to facilitate the formation of pores. The press cake is granulated and dried. In an example, sodium silicate is treated with concentrated hydrochloric acid, the precipitate pressed at 550 atmospheres pressure, dried and granulated at 100°-200° C., or heated gradually to 400° C.

255,876. AMMONIUM SULPHATE. W. Demann, 8, Schulstrasse, Hardel, Bochum, Germany. International Convention date, July 24, 1925.

A saturated alkaline solution of ammonium sulphate is freed from iron compounds by treating with gas liquor containing hydrogen sulphide, and this is used for neutralising crude ammonium sulphate. The saturated alkaline solution is treated with gas liquor in a vessel 1, and passes through a filter 5 to a neutraliser 6 having a heating coil 7. The sulphate



255,876

to be treated is added at 10, and the mixture is raised to a container 11, from which it passes to a centrifuge 12. The liquor passes to a reservoir 18 or to the neutraliser 6. Evolved vapour is collected through pipes 9, 13, 19, and is treated for the recovery of pyridine and ammonia.

255,880. ALCOHOLATES. C. Van Loon, 142, Singel, Dordrecht, Holland. (Assignee of C. Delsman, 5, Von Delstraat, Nijmegen, Holland.) International Convention date, July 21, 1925.

Alkali metal alcoholates of compounds containing alcoholic hydroxyl groups which with relation to their acidity and small volatility are suitable for the purpose are obtained by evaporating the solution of the hydroxyl-containing compound in aqueous alkali hydroxide under reduced pressure, and finally passing hydrogen through at reduced pressure.

255,884. CATALYSTS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, July 22, 1925.

The process is for obtaining catalysts for hydrogenating processes, *e.g.*, in the production of isopropyl alcohol from acetone, ethylamine from acetonitrile, and piperidine from pyridine. A mixture of ammoniacal nickel nitrate and silicic acid gel is heated to 70° C. and treated with a current of air. The precipitate obtained after 4 hours is filtered, washed and dried, and then treated with hydrogen at 100-130° C., rising gradually to 415°-420° C. The product is quickly cooled in hydrogen and poured into a suitable suspending agent.

255,886. SULPHATES OF ORGANIC AMIDES. Roessler and Hasslacher Chemical Co., New York. (Assignees of R. B. Trusler, 1321, Tennessee Avenue, Dormont, Pa., U.S.A.) International Convention date, July 22, 1925.

To obtain sulphates of organic amides, the corresponding nitrile is treated with dihydrated sulphuric acid with or without a halogen compound as catalyst. Simple aliphatic nitriles or such nitriles containing a single hydroxyl group may be treated, but not nitriles containing two adjacent hydroxyl groups. Examples are given of the production of formamide sulphate, lactamide sulphate and benzamide sulphate.

255,887. ESTERS. Roessler and Hasslacher Chemical Co., New York. (Assignees of R. B. Trusler, 1321, Tennessee Avenue, Dormont, Pa., U.S.A.) International Convention date, July 22, 1925.

Sulphates of organic amides, prepared as described in 255,886 above are treated with alcohols and heated under reflux. Examples are given of the production of ethyl formate, allyl formate, benzyl acetate, propyl benzoate, glycol diformate, glycol monoformate, glyceryl monoformate, glyceryl diformate.

255,892. ORGANO ARSENIC COMPOUNDS. A. Binz and C. Räth, 42, Invalidenstrasse, Berlin. International Convention date, July 22, 1925.

These compounds are obtained by reduction of arsinic acids containing hydroxyl groups by means of the formaldehyde, diformaldehyde and acetone compounds of sulphoxylic acid at a temperature below 50° C.

LATEST NOTIFICATIONS.

258,551. Emulsifying agents. I. G. Farbenindustrie Akt.-Ges. September 18, 1925.

258,553. Manufacture of heterocyclic compounds. I. G. Farbenindustrie Akt.-Ges. September 15, 1925.

258,563. Manufacture of dyestuffs. Soc. of Chemical Industry in Basle. September 16, 1925.

258,575. Treatment of zinc-bearing ores for the recovery of zinc by electrolytic deposition. Electrolytic Zinc Co. of Australasia, Ltd. September 17, 1925.

258,576. Purification of crude benzol. I. G. Farbenindustrie Akt.-Ges. September 15, 1925.

258,608. Manufacture and production of liquid hydrocarbons. I. G. Farbenindustrie Akt.-Ges. September 17, 1925.

258,611. Process of dyeing cellulose esters and ethers. I. G. Farbenindustrie Akt.-Ges. September 17, 1925.

258,616. Manufacture of acid-proof cementing compositions. I. G. Farbenindustrie Akt.-Ges. September 18, 1925.

Specifications Accepted with Date of Application

235,588. Hydroxides and carbonates, Process of producing. M. Buchner. June 14, 1924.

242,590. Tartrates, Manufacture of. Chemische Fabrik Dr. H. Stoltzenberg. November 5, 1924.

244,736. Separation of the lowest boiling constituents of a mixture of liquids by vacuum distillation. A. Schmalenbach. December 22, 1924.

244,739. Quantitatively halogenising perylene, Process for. A. Pongratz and A. Zinke. December 19, 1924.

249,801. Producing distillation oils by distillation, Process of and apparatus for. Simplex Refining Co. March 30, 1925.

252,308. Low boiling point hydrocarbons from hydrocarbons having a high boiling point, Process for the continuous production of. H. Wolf. May 22, 1925.

257,689 and 258,154. Ammonia, Manufacture of. H. W. Blackburn and W. Thomas. June 9, 1925.

257,968. Acetic anhydride, Manufacture of. H. Dreyfus. April 9, 1925.

257,979. Sulphonation of aromatic amines. J. W. Leitch and Co. and A. E. Everest. June 2, 1925.

257,991. Preparations of dyestuffs. O. Y. Imray. (*Soc. of Chemical Industry in Basle.*) June 8, 1925.

258,020. Cellulose acetate. Manufacture of. H. J. Mallabar. June 17, 1925.

258,024. Refractory metals, Production and treatment of. A. S. Cachemaille. (*Westinghouse Lamp Co.*) June 19, 1925.

258,048. Solid compounds of ammonia, carbon dioxide and water, Production of. Synthetic Ammonia and Nitrates, Ltd., and T. Coxon. July 23, 1925.

258,060. Chloro- and nitro-chloro- derivatives of meta-hydroxybenzaldehyde, Manufacture of. British Dyestuffs Corporation, Ltd., and H. H. Hodgson. August 13, 1925.

258,099. Oxidation of fats, oils, waxes, resins and other materials of a like nature. J. Y. Johnson. (*Badische Anilin und Soda Fabrik.*) October 16, 1925.

258,144. Phosphatic fertilisers, Manufacture of. O. R. Olsen and E. Torkildsen. January 11, 1926.

258,165. Evaporating, distilling or concentrating liquid, Apparatus for. Soc. des Condenseurs Delas. January 18, 1926.

258,203. Symmetrical di-aryl-guanidines, Process for the production of. Silesia Verein Chemischer Fabriken. September 23, 1925.

Applications for Patents

Attwater, R. Production of moulded phenol aldehyde condensation products. 23,572. September 24.

Bell and Croyden, Ltd., J. Electric lamp for judging, etc., coloured articles. 23,591. September 24.

British Celanese, Ltd. Cellulose fibres, fabrics, etc. 23,312. September 21. (United States, September 22, 1925.)

British Dyestuffs Corporation, Ltd. Manufacture of wetting-out agents, etc. 23,161. September 20.

British Dyestuffs Corporation, Ltd, Payman, J. B., and Wignall, H. Manufacture of derivatives of 2 : 3-hydroxynaphthoic arylides. 23,162. September 20.

British Dyestuffs Corporation, Ltd. Detergent cleansing and polishing compositions. 23,308. September 21.

Coley, H. E., and Hornsey, J. W. Production of magnetic oxide of iron. 23,601. September 24.

Coley, H. E., and Hornsey, J. W. Rotary furnaces, etc. 23,603 September 24.

Coley, H. E., and Hornsey, J. W. Method of sealing rotary kilns, etc. 23,604. September 24.

Coley, H. E., and Hornsey, J. W. Production of iron. 23,605, 23,606, 23,607, 23,609. September 24.

Coley, H. E., and Hornsey, J. W. Manufacture of alloys. 23,608, 23,610. September 24.

Coley, H. E., and Hornsey, J. W. Manufacture of steel. 23,611, 23,612. September 24.

Evans, E. V. Manufacture of hydrocarbons, etc. 23,626. September 24.

Fiorini, A. Naphtha carburettors. 23,205. September 20.

Hatfield, H. S. Means for effecting chemical analysis of liquids. 23,129, 23,130. September 20.

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of isodibenzanthrones. 23,199. September 20. (October 9, 1925.)

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of copper sulphate. 23,509. September 23.

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of condensation products. 23,623. September 24.

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of isatin derivatives. 23,703. September 25.

I. G. Farbenindustrie Akt.-Ges. Regeneration of catalysts used in production of phosphorus pentoxide, etc. 23,200. September 20. (Sweden, September 29, 1925.)

I. G. Farbenindustrie Akt.-Ges. Production of phosphorus pentoxide or phosphoric acid. 23,541. September 23. (Germany, October 22, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 23,647. September 24. (Germany, September 25, 1925.)

Imray, O. Y., and Soc. of Chemical Industry in Basle. Manufacture of anthraquinone derivatives. 23,274. September 21.

Lazote, Inc. Method of effecting catalytic reactions. 23,529. September 23. (United States, September 24, 1925.)

Low Temperature Carbonization, Ltd., and Parker, C. H. Distillation of coal, etc. 23,706, 23,710. September 25.

Metallbank und Metallurgische Ges. Akt.-Ges. Process of treating crude oils, etc., in vacuo. 23,140. September 20. (Germany, August 9.)

Metallbank und Metallurgische Ges. Akt.-Ges. Copper Alloys. 23,318. September 21. (Germany, April 15.)

Meyer, E. M. Preparation of water-soluble albumin. 23,436. September 22. (United States, October 20, 1925.)

Newport Co. Preventing dissolution of iron and steel in sulphuric acid. 23,153. September 20. (United States, September 30, 1925.)

Remy, W., and Roitzheim, A. Treating zinc ores, etc. 23,376. September 22. (Germany, November 13, 1925.)

Scottish Dyes, Ltd., Thomas, J., and Thomson, R. F. Manufacture of dyestuffs, etc. 23,617. September 24.

Southall, J. Separation of solids from liquids. 23,461. September 23.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton, Powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £23 per ton. Powder, £24 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4⅞d. to 5d. per lb. Crude 60's, 1s. 4d. to 1s. 8d.

ACID CRESYLIC 99/100.—2s. 6d. per gall. 97/99.—2s. to 2s. 1d. per gall. Pale, 95%, 2s. 3d. per gall. Dark, 1s. 9d. to 2s. 3d. per gall. Steady.

ANTHRACENE.—A quality, 2½d. to 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.

BENZOL.—Crude 65's, 1s. 1d. to 1s. 5d. per gall., ex works in tank wagons. Standard Motor, 1s. 8½d. to 2s. 3d. per gall., ex works in tank wagons. Pure, 1s. 11d. to 3s. per gall., ex works in tank wagons.

TOLUOL.—90%, 2s. to 3s. 3d. per gall. Pure, 2s. 3d. to 3s. 6d. per gall.

XYLOL.—2s. 3d. to 3s. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. per gall. Standard specification, 6¾d. to 7⅛d. middle oil, 7d. to 7½d. per gall. Heavy, 8d. to 8½d. per gall.

NAPHTHA.—Crude, 10d. to 1s. 1d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 3d. per gall. Solvent 90/190, 1s. 3½d. to 1s. 5d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £4 10s. to £5 10s. per ton. Whizzed or hot pressed, £5 10s. to £7 10s.

NAPHTHALENE.—Crystals, £11 10s. to £12 10s. per ton. Flaked, £12 10s. to £13, according to districts.

PITCH.—Medium soft, 115s. to 140s. per ton, according to district.

PYRIDINE.—90/140, 16s. to 18s. per gall. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. 6d. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—9½d. per lb. naked at works.

ANILINE SALTS.—9½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID—1s. 8½d. per lb.

o-CRESOL 29/31° C.—3d. to 3½d. per lb.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. 2d. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 3d. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—10d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8. Grey, £17 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£7 to £9 per ton, according to grade and locality.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 6d. per gall. 60% O.P. Solvent, 3s. 6d. per gall, 40% O.P.

WOOD TAR.—£3 to £5 per ton, according to grade.

BROWN SUGAR OF LEAD.—£39 to £40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.

ACID, BORIC B.P.—Crystal, £44 per ton; Powder, £48 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 2½d. to 1s. 6d. per lb.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC.—1s. 3½d. to 1s. 5d. per lb. Technical.—10½d. to 11d. per lb.

ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.

ACID, TARTARIC.—1s. 0½d. per lb., less 5%. Market firm.

AMIDOL.—9s. 6d. per lb., d/d.

ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—11s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—8s. 9d. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—12s. 3d. to 14s. 3d. per lb.

BISMUTH CITRATE.—9s. 3d. to 11s. 3d. per lb.

BISMUTH SALICYLATE.—10s. to 12s. per lb.

BISMUTH SUBNITRATE.—10s. 6d. to 12s. 6d. per lb., according to quantity

BORAX B.P.—Crystal, £27; Powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 8d. to 1s. 11d. per lb.; sodium, 1s. 10d. to 2s. 2d. per lb.; ammonium, 2s. 1d. to 2s. 5d. per lb., all spot.

CALCIUM LACTATE.—1s. 5d.

CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—7s. to 7s. 6d. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.

IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.

MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

MENTHOL.—A.B.R. recrystallised B.P., 20s. net per lb., Synthetic, 10s. 6d. to 12s. per lb., according to quantity.

MERCURIALS.—Red oxide, 5s. 9d. to 6s. 4d. per lb.; Corrosive sublimate, 4s. to 4s. 8d. per lb.; white precipitate, 4s. 10d. to 5s. 2d. per lb.; Calomel, 5s. to 5s. 2d. per lb.; Yellow Oxide, 5s. 7d. to 5s. 8d. per lb.

METHYL SALICYLATE.—1s. 7d. per lb.

METHYL SULPHONAL.—15s. 6d. per lb.

METOL.—11s. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 9d. to 4s. per lb.

PHENAZONE.—5s. 9d. to 6s. per lb.

PHENOLPHTHALEIN.—4s. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—81s. per cwt., less 2½% for ton lots.

POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 6½d. per lb., spot.

QUININE SULPHATE.—2s. per oz., 1s. 8d. in 100 oz. tins.

RESORCIN.—4s. 3d. per lb., spot.

SACCHARIN.—55s. per lb.

SALOL.—3s. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb. carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 85s. per cwt., according to quantity.

SODIUM SALICYLATE.—Powder, 1s. 10d. per lb. Crystal, 1s. 11d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—10s. 6d. per lb.

TARTAR EMETIC, B.P.—Crystal or Powder, 1s. 11d. to 2s. per lb.

THYMOL.—12s. 6d. to 13s. 9d. per lb., according to quantity.

Perfumery Chemicals

ACETOPHENONE.—10s. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—5s. 6d. per lb.

AMYL SALICYLATE.—3s. 3d. per lb.

ANETHOL (M.P. 21/22° C.).—6s. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 1d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 1d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 7d. per lb

BENZYL BENZOATE.—2s. 4d. per lb.

CINNAMIC ALDEHYDE NATURAL.—18s. per lb.

COUMARIN.—11s. 6d. per lb.

CITRONELLOL.—15s. per lb.

CITRAL.—9s. 6d. per lb.

ETHYL CINNAMATE.—10s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—10s. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—6s. 3d. to 10s. 6d. per lb.

HELIOTROPINE.—5s. per lb.

ISO EUGENOL.—14s. 6d. per lb.

LINALOL.—12s. to 17s. per lb.

LINALYL ACETATE.—15s. to 18s. 6d. per lb.

METHYL ANTHRANILATE.—9s. 3d. per lb.

METHYL BENZOATE.—5s. per lb.

MUSK KETONE.—34s. per lb.

MUSK XYLOL.—8s. 3d. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—12s. per lb.

PHENYL ETHYL ALCOHOL.—10s. per lb.

RHODINOL.—30s. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—20s. 6d. per lb.

Essential Oils

ALMOND OIL.—11s. 6d. per lb.

ANISE OIL.—3s. 6d. per lb.

BERGAMOT OIL.—29s. per lb,

BOURBON GERANIUM OIL.—14s. per lb.

CAMPHOR OIL.—67s. 6d. per cwt.

CANANGA OIL, JAVA.—20s. per lb.

CINNAMON OIL, LEAF.—6d. per oz.

CASSIA OIL, 80/85%.—9s. 3d. per lb.

CITRONELLA OIL.—Java, 85/90%, 2s. 7d. Ceylon, 2s. 2d. per lb.

CLOVE OIL.—6s. 9d. per lb.

EUCALYPTUS OIL, 70/75%.—2s. per lb.

LAVENDER OIL.—French 38/40%, Esters, 18s. 6d. per lb.

LEMON OIL.—10s. 6d. per lb.

LEMONGRASS OIL.—4s. 6d. per lb.

ORANGE OIL, SWEET.—10s. 3d. per lb.

OTTO OF ROSE OIL.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.

PALMA ROSA OIL.—9s. 9d. per lb.

PEPPERMINT OIL.—Wayne County, 37s. 6d. per lb. Japanese, 11s. 9d. per lb.

PETITGRAIN OIL.—9s. per lb.

SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, September 30, 1926.

THERE is a brighter tone in evidence on the market this week, although actual business still continues along the recent quiet lines. Prices again remain practically stationary and orders are in the main for small quantities. It is felt, however, that a settlement of the coal strike is in sight, and that soon thereafter there will be a resumption of activity in many of the chemical consuming industries.

Export demand continues fair, although many orders have still to be placed on the Continent which normally would be executed in this country.

General Chemicals

ACETONE.—The market is nominal and business entirely a matter of negotiation; demand continues almost non-existent.

ACID ACETIC continues in fair request without change in value at £37 per ton for 80% technical, with £1 per ton extra for pure.

ACID FORMIC is steady and price is unchanged at about 52s. per cwt. for 85% on the spot.

ACID LACTIC is only a moderate market, but the price continues firm at £43 per ton for 50% by weight.

ACID OXALIC.—The improved demand continues, price varies from 3⅝d. to 3¾d. per lb., according to quantity and position.

ACID TARTARIC is very quiet at 11¼d. to 11¾d. per lb.

ALUMINA SULPHATE.—Only a moderate business is passing at the moment, as is to be expected at this time of the year; higher prices are expected for next year, but, of course, are not yet announced.

AMMONIUM CHLORIDE is in fair request at £18 to £19 5s. per ton.

BARIUM CHLORIDE is a fairly easy market at £9 15s. per ton.

COPPER SULPHATE is unchanged, although there is some small inquiry in evidence.

EPSOM SALTS continues in fair request at £5 10s. per ton.

FORMALDEHYDE is in better demand and is quoted at round about £40 to £41 per ton, and with any improvement in the consumption an advance in price is certain.

LEAD ACETATE is fairly active, and is quoted at £45 per ton for white and £43 per ton for brown.

METHYL ACETONE continues very firm and is quoted at £55 to £56 per ton.

METHYL ALCOHOL is only in poor request, and supplies can be obtained at from £48 to £49 per ton.

POTASSIUM CHLORATE is in fair demand at 3½d. per lb.

POTASSIUM PERMANGANATE is quiet and is quoted at 7¼d. to 7½d. per lb. for B.P.

POTASSIUM PRUSSIATE is firmer and in much better request; the price is from 6¾d. to 7d. per lb.

SODIUM ACETATE is fairly scarce for early delivery, and is quoted at from £19 15s. to £20 15s. per ton for near delivery.

SODIUM BICHROMATE is in active request; British makers' prices are unchanged, but continental competition is keen.

SODIUM NITRITE is quietly steady at £20 10s. per ton.

SODIUM PHOSPHATE is unchanged at £14 per ton and is a firm market.

SODIUM PRUSSIATE has become much firmer and there is a fair amount of inquiry in the market for forward delivery; the price is firm at 3⅞d. to 4d. per lb.

SODIUM SULPHIDE is unchanged at British makers' figures.

ZINC SULPHATE is quoted at about £14 per ton with a fair demand.

Coal Tar Products

The prolongation of the coal strike is making the supply of coal tar products more difficult every day.

90's BENZOL is being quoted at 2s. 2d. per gallon on rails, while the motor quality is quoted at 2s. 1d. on rails.

PURE BENZOL is in very short supply, and is worth about 4s. per gallon.

CREOSOTE OIL is worth about 8d. per gallon on rails at works in the country, while the price in London is 9d. to 9½d. per gallon, at works.

CRESYLIC ACID.—The pale quality 97/99% is worth about 2s. 2d. per gallon on rails, and the dark quality 95/97% is quoted at 2s. 1d. per gallon, on rails.

SOLVENT NAPHTHA is quoted at 1s. 10d. per gallon on rails, makers' works.

HEAVY NAPHTHA is in short supply, and worth about 1s. 6d. per gallon on rails.

NAPHTHALENES are scarce; the 76/78 quality is worth about £8 per ton on rails, and the 74/76 quality is being quoted at about £7 10s. per ton, at makers' works.

Latest Oil Prices

LONDON.—LINSEED OIL closed quieter and 2s. 6d. to 10s. higher. Spot, £30 5s., ex mill; September, £29 5s.; October-December, £29 15s.; January-April, £30 17s. 6d. RAPE OIL quiet. Crude, extracted, £46 10s.; technical, refined, £48 10s., ex wharf. COTTON OIL slow. Refined common edible, £41; Egyptian crude, £34; deodorised, £43. TURPENTINE firm and 3d. to 6d. per cwt. higher. American, spot, 64s. 6d.; October-December, 65s.; January-April, 67s.; and May-June, 65s. 9d.

HULL.—LINSEED OIL.—Naked, spot, £30 12s. 6d.; September and October-December, £30 15s.; January-April, £30 17s. 6d. COTTON OIL.—Naked, Bombay, crude, £33; Egyptian, crude, £33 10s.; edible, refined, £37 10s.; technical, £36 10s. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £40. GROUNDNUT OIL.—Crushed/extracted, £43 10s.; deodorised, £47 10s. SOYA OIL.—Extracted and crushed, £36; deodorised, £39 10s. RAPE OIL.—Crude/extracted, £46; refined, £48 per ton, net cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Nitrogen Products

EXPORT.—On account of the small supplies available from British ports, the price has been raised a little, and goods are now fetching from £11 to £11 2s. 6d., f.o.b., in single bags. On account of the uncertainty of the coal dispute, British producers are selling only very small quantities for prompt or even forward delivery.

HOME.—The announcement of home prices has been followed by the steady booking of orders for forward delivery. No doubt this is due to anxiety regarding supplies. Producers are kept busy delivering sulphate contracted to fertiliser manufacturers. It is understood that the demand for this purpose is slightly above that of last year.

NITRATE OF SODA.—The nitrate market continues flat, with only small sales being made. It is not expected that there will be any livening until the end of the year. There seems to be some evidence of reduced consumption for this year even in the United States.

Calcium Cyanamide

FOR October delivery the price of this fertiliser to farmers is £9 6s. per ton for 4-ton lots, carriage paid to any railway station in Great Britain. At the present time distinct interest is being shown in the use of calcium cyanamide for autumn application to corn crops and grassland.

Lead Manufacturers' Association Formed

THE British Lead Manufacturers' Association has been registered as a company limited by guarantee and not having a capital divided into shares, with 100 members, each liable for £10 in the event of winding up. The objects are to protect the interests of manufacturers of sheet lead and lead pipes and other lead manufactures in the British Isles, including Ireland; to register and use trade marks, to carry on business as manufacturers of and dealers in lead goods, etc. The management is vested in a committee, the first members of which are: Colonel A. J. Foster, Capel House, New Broad St., London, E.C., lead manufacturer (chairman); F. Reid, Milburn House, Newcastle-upon-Tyne, vice-chairman (director of Cookson Lead and Antimony Company); A. R. Rivet, 19–23, Rochester Row, London, S.W.1 (general manager, T. and W. Farmiloe); A. G. Simkins, 63, Belvedere Road, Lambeth, London, S.E.1 (director of Walkers Parker and Co.); A. Giddings, Chapel Street, Salford (director of Giddings and Dacre); G. D. Armstrong; Cheese Lane, Bristol, lead manufacturer (of Sheldon Bush and P. S. Company). The secretary is W. K. Wenham, 36, New Broad Street, London, E.C.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, September 29, 1926.

THERE is no change of any importance to record since our last report, the continued stoppage in the coal industry preventing any large scale movements of heavy chemicals. Notwithstanding small demands prices remain steady.

Industrial Chemicals

ACID ACETIC, 98/100%.—£55 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £39 to £41 per ton; 80% technical, £38 to £39 per ton, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flakes, £37 per ton; powdered, £39 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Unchanged at about 5½d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—In little demand and now on offer at 1s. 3d. per lb., less 5% ex store. Offered for early shipment at a fraction less, ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80%.—Usual steady demand and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Spot material unchanged at 3¾d. per lb., ex store. Quoted 3¾d. per lb., ex wharf for prompt shipment.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads; dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Spot material on offer at 11¾d. per lb., less 5% ex store. Quoted 11¼d. per lb., less 5% ex wharf to come forward.

ALUMINA SULPHATE, 17/18% IRON FREE.—Spot material on offer at about £6 per ton, ex store. Quoted £5 8s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent.

ALUM, LUMP POTASH.—On offer from the Continent at £7 15s. per ton, c.i.f. U.K. ports. Spot material quoted at £9 per ton, ex store. Crystal powder, £8 5s. per ton, ex store, or £7 12s. 6d. per ton, c.i.f. U.K. port.

AMMONIA ANHYDROUS.—Imported material selling at about 11¼d. to 11½d. per lb., ex wharf, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £23 10s. to £25 10s. per ton, ex station. Continental on offer at about £21 10s. per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £18 5s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—In moderate demand and price unchanged at £16 5s. per ton, ex store, or £15 10s. per ton, ex wharf, prompt despatch from mines.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Rather higher quotations from the Continent. Now quoted £8 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at £9 12s. 6d. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—English material unchanged at £9 10s. per ton, ex station. Contracts 20s. per ton less. Continental now quoted £7 15s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals, £23 per ton; powdered, £24 per ton, carriage paid U.K. stations.

CALCIUM.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental again lower at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or at £4 2s. 6d. per ton, f.o.b. U.K. port, for export.

COPPER SULPHATE.—Continental material on offer at about £22 per ton, ex wharf. Moderate inquiry for export and price of English material about £23 5s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Rather cheaper quotations from the Continent. Now on offer at £38 per ton, c.i.f. U.K. ports. Spot material unchanged at about £40 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material quoted £38 per ton, ex store.

LEAD, WHITE.—Quoted £38 10s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £44 10s. per ton, c.i.f. U.K. ports, prompt shipment. Brown about £40 5s. per ton, c.i.f. U.K. ports.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH CAUSTIC, 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton, c.i.f. U.K. ports, according to quantity and destination. Spot material available at about £29 per ton.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE.—96/98% quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store. 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Powdered quality on offer from the Continent at about £25 10s. per ton, c.i.f. U.K. ports; crystals £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—Spot material quoted £24 per ton, ex store. On offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—On offer at 7d. per lb., ex store, spot delivery. Quoted 6¾d. per lb., ex wharf early shipment.

POTASSIUM PRUSSIATE, YELLOW.—Unchanged at about 6¾d. per lb., ex store, spot delivery. On offer from the Continent at about 6¾d. per lb., c.i.f. U.K. ports.

SODA CAUSTIC.—76/77%, at £17 10s. per ton; 70/72%, £16 2s. 6d. per ton. Broken, 60%, £16 12s. 6d. per ton. Powdered, 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—English material quoted £22 per ton, ex station. Continental on offer at about £20 10s. per ton, ex store, or to come forward £19 15s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb., delivered.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Pow dered or pea quality £1 7s. 6d. per ton more; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 per ton, ex station. Minimum 4-ton lots. Pea crystals, £14 10s. per ton, ex station. Continental commercial quality quoted £7 15s. per ton, c.i.f. U.K. ports.

SODIUM NITRITE, 100%.—Quoted £20 17s. 6d. per ton, ex store, spot delivery.

SODIUM PRUSSIATE (YELLOW).—In moderate demand for export, and prices unchanged at about 3⅝d. per lb., f.o.b. continental port. Spot material available at 3¾d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE, 60/62%.—Solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 6d. per ton. All delivered buyers' works U.K. Minimum 5-ton lots, with slight reduction for contracts; 60/62%, solid quality, offered from the Continent at about £8 15s. per ton, c.i.f. U.K. ports. Broken quality 15s. per ton more. Crystals, 30/32%, about £6 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £11 10s. per ton; roll, £10 5s. per ton; rock, £10 5s. per ton; floristella, £9 15s. per ton; ground American, £9 per ton. Ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid, on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental make on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

ALPHA NAPHTHOL.—2s. per lb.; some home inquiries.

SODIUM NAPTHIONATE.—1s. 8d. to 1s. 9d. per lb., 100%; fair home inquiries.

PARANITRANILINE.—1s. 9d. per lb.; some home inquiries.

H. ACID.—3s. 3d. per lb., 100%; small home inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, September 30, 1926.

Traders' experience on the Manchester chemical market during the past week has been no better than it has been recently, although no real improvement is looked for until the coal stoppage is a thing of the past and the consuming industries are able to work at something approaching their normal capacities. Both for home use and for shipment the demand is on a limited scale, and in the case of one or two lines prices can hardly be described as steady, although as regards most of the products there has been little movement either way.

Heavy Chemicals

There has been a moderate call for bicarbonate of soda at firm prices, about £10 10s. per ton in bags still being quoted. Nitrite of soda is not attracting much interest from buyers, but values remain at from £19 to £19 10s. per ton. Glauber salts are quiet at about £3 15s. per ton, whilst saltcake is also only a slow seller at £3 5s. per ton. Prussiate of soda is in fair request and prices are firm at 3¾d. to 3¾d. per lb. The demand for sulphide of soda is restricted and values are easy at about £10 per ton for 60-65 per cent. concentrated solid and £8 10s. for commercial crystals. Alkali, 58 per cent. material, is well held at round £6 15s. per ton. Caustic soda likewise is fully maintained at from £17 10s. per ton for 76 per cent. down to £15 2s. 6d. for 60 per cent. and a quietly steady trade in this product continues to be put through. Phosphate of soda is slow and easy at £12 5s. per ton. Bichromate of soda is only in limited request but values are about unchanged at 3¼d. per lb. Hyposulphite of soda is rather slow at £15 5s. per ton for photographic quality and £9 10s. for commercial. Chlorate of soda is still on offer at 3¼d. per lb. but the demand remains quiet. Bleaching power is in moderate inquiry, although much below normal; prices are unchanged at round £8 10s. per ton.

Bichromate of potash shows little change on the week, quotations still being round 4¼d. per lb. The demand for permanganate of potash is confined within narrow limits and prices have an easy tendency, B.P. quality offering at about 6¾d. per lb. and commercial at 5d. to 5¼d. There is no pressing call for carbonate of potash at the moment and here also values tend to recede a little, round £26 per ton now being quoted. For caustic potash prices are still in the neighbourhood of £27 per ton, but only a quiet demand is reported. Chlorate of potash is in moderate request at from 3½d. to 3⅝d. per lb. Yellow prussiate of potash keeps fairly steady at round 6¾d. per lb., although inquiry for this shows little improvement over that of recent weeks.

Some firms report a somewhat better call for arsenic, and values are held at £13 10s. per ton, on rails, for white powdered, Cornish makes. Sulphate of copper continues to be quoted at last week's range of £22 10s. to £23 per ton, f.o.b., and a quiet trade is being put through. Nitrate of lead is only in limited request, but prices keep fairly steady at £40 to £41 per ton. The acetates of lead are also maintained, although no important volume of trade is being done; white is on offer at about £45 10s. per ton, and brown at £41. Acetate of lime is little changed at £17 5s. per ton for grey material and about £8 for brown, the demand being quiet.

Acids and Tar Products

A quiet trade is being put through in the case of acetic acid at round £37 per ton for 80 per cent. commercial material, with glacial acetic still quoted at £66 per ton. The demand for citric acid is still quiet and values are easy, an average price to-day being about 1s. 3¼d. per lb. There is not much buying interest either in the case of tartaric acid although prices in this section show little change on the week, the range being 11½d. to 11¾d. per lb. Oxalic acid remains quiet but fairly steady at 3¼d. to 3¾d. per lb.

With the main sources of supply at a standstill, the coal-tar products are exceptionally firm, with up to £7 per ton basis, f.o.b., now being quoted for pitch. For creosote oil about 8¼d. per gallon is still being asked, with solvent naphtha offered in limited quantities at 1s. 11d. per gallon. In the case of carbolic acid values are largely nominal at about 5½d. per lb. for crystals and 1s. 4¾d. per gallon for crude material.

Eastwoods Cement Progress

On Thursday, September 16, Mr. Horace Boot (the chairman) presiding, the first ordinary general meeting of Eastwoods Cement, Ltd., was held at River Plate House, London. In his speech the chairman said that at the statutory meeting last July he was able to outline their scheme for the construction of a modern cement works with British plant, by British labour, and financed by British capital. The firm's property consisted of 151½ acres of the finest cement marl at Barrington, Cambs. It included a manager's house and buildings, and also the works' sidings which had since been completed. During the year the directors had had the opportunity of acquiring on very favourable terms with option to purchase the lease of a lime works situated within a few miles of their cement works; and as to-day there was a great shortage of lime, they had decided to start working. Without being too optimistic, the quality of the material and the advantages possessed by the company, considering the exceptionally low capital outlay, were such as to ensure a prosperous future for their company. They would very shortly have to consider the advisability of increasing the plant by the addition of a further kiln, which would bring the production from 1,000 tons to 2,000 tons per week. The consulting engineers, in designing the works, had already made arrangements for the extensions, and, for a comparatively small increase in the capital outlay, the output for which the works were at present designed could be doubled. The report and accounts were unanimously adopted. Mr. E. T. Godfrey proposed a vote of thanks to the chairman and directors, and congratulated them on the results so far achieved. Mr. F. H. M. Burton seconded the motion, which was cordially adopted.

Fuel Technologists' Programme

The autumn programme of the Institution of Fuel Technology has been approved by its Council. The meeting will extend over two days—Tuesday and Wednesday, December 7 and 8. On the first day Sir Alfred Mond will deliver his presidential address, and an inaugural dinner will be held in the evening. The papers, whose authors are famous in the world of science, will be: Professors W. Groume Grjimailo (University of Moscow), "Laws of Gas Flow in Furnaces"; Sir Richard Redmayne, K.C.B., "The Occurrence, Working, and Treatment of Brown Coal, with Special Reference to German Practice"; Mr. S. McEwen, "Low Temperature Distillation of Coal"; Sir John Biles, K.C.I.E., "Steam Power Production"; Professor J. Tausz (University of Karlsruhe), "The Hydrogenation of Liquid Fuel"; Professor R. T. Haslam (University of Massachusetts, U.S.A.), "The Combustion of Carbon"; Mr. T. Hardie (chief engineer, the Gas Light and Coke Co.), "Practice in Gas Manufacture"; Dr. J. S. Owens, M.D., A.M.I.C.E. (Superintendent, Advisory Committee on Atmospheric Pollution), "Smoke and Public Health." Since the general meeting on July 30 last, 250 founder members have been enrolled. Full particulars can be obtained from the Secretary, 314, Caxton House (East), Tothill Street, Westminster, S.W.1.

Chemical "Fair Wages" List

The National Union of Drug and Chemical Workers have started a national campaign against firms who contract to national or local authorities for the supply of chemicals, drugs, druggist sundries, disinfectants, dyes, colours, hospital, medical and surgical supplies, patent medicines, medicinal foods, photographic materials and supplies, soaps and toilet preparations who do not employ trade union labour and operate the standard national agreement existing between the Union and the Drug and Fine Chemical Manufacturers' Association, and other federated or non-federated firms.

All national and local authorities are being circularised with the Union's "fair list," and advised that in the full observance of the contractors' fair wages clause all contracts should be restricted to firms appearing from time to time on that "fair list." In order to secure further safeguards, all local labour parties are being circularised with the "fair list," with a request that they instruct their representatives on borough councils, boards of guardians, etc., to oppose any and all contracts given to firms not appearing on the list.

Company News

SANITAS TRUST.—A dividend at the rate of 10 per cent. per annum is to be paid on the preference shares.

BARRY, OSTLERE AND SHEPHERD.—An interim dividend on the ordinary shares, at the rate of 5 per cent., is payable on October 15.

BROKEN HILL SOUTH.—The directors announce that a dividend at the rate of 1s. 6d. and a bonus of 1s. have been declared payable on November 15.

NORTH BROKEN HILL.—Warrants for dividend No. 67 of 2s., and a bonus of 2s., payable on September 27, have been posted to the shareholders on the London register.

ENGLISH MARGARINE CO.—An interim dividend on the cumulative participating preference shares is announced at the rate of 7 per cent. per annum, less tax at 4s. in the £.

INTERNATIONAL PAINT AND COMPOSITIONS CO.—The board announces that there is no foundation whatever in the rumours existing that the company is contemplating amalgamation.

SPANISH RIVER PULP AND PAPER MILLS.—The directors have declared the usual dividend of 1¾ per cent. on both the common and preferred stock for the quarter ending September 30, payable on October 15.

AMALGAMATED ZINC (DE BAVAY'S), LTD.—The profit for the half year ended June 30 last amounted to £31,406. This profit, added to the balance of £21,455 at the end of December last, made available £52,861, from which £1,074 has been deducted for investigations account, leaving £51,787 to be carried forward.

CHEMICAL AND METALLURGICAL CORPORATION, LTD.—In order to provide for the capital expenditure required for the development of a site on the Manchester Ship Canal, it has been decided to offer at par, 1,179,531 ordinary shares of the unissued capital to the holders of the ordinary shares in the proportion of one share for each two shares now held.

INDUSTRIAL STEELS, LTD.—In their report for the year ended December last year, the directors state there was a net trading loss of £1,639. The amount brought in was £8,161, which is reduced to £6,522 by the deduction of net loss. The balance is carried forward. The scheme for reduction of capital was not sanctioned by the court until June, 1925, and consequently the new board did not commence to function until the half-year.

BURT, BOULTON AND HAYWOOD, LTD.—The net profits for the year ended June 30 last, after placing £15,000 to depreciation, £5,577 to debenture redemption reserve, and meeting £6,942 of expenses of debenture stock and preference share issues, totalled £64,140. The directors propose a final dividend of 5 per cent. on the ordinary capital of £466,003, again making 10 per cent., less tax, while workers' certificates receive a further payment of £396, making £802 for year. After placing £4,000 to general reserve the balance to be carried forward is £16,658.

Tariff Changes

PALESTINE.—An official announcement, published on August 1, notifies that olive kernel oil (Grignon oil) for soap making, has been included in the list of goods which may be imported into Palestine free of Customs duty, whilst olive oil, which is not intended for industrial purposes, is subject to the payment of the full import duty of 12 per cent. ad valorem.

TERRITORY OF NEW GUINEA.—The Customs Tariff Proclamation No. 1, dated April 2, 1926, brings into operation in the Territory, as from April 3, a revised scale of Customs duties. Under the present Proclamation of Oils, duties are now leviable on shale, naphtha, benzine, turpentine substitutes, kerosene, linseed, and castor oil, etc.

FRANCE.—A Presidential Decree dated September 11, prohibits the export and re-export (after warehousing, transit, or transhipment) from France of potassium chloride and sulphate of potash extracted from the soil, and of compound fertilisers containing potassium chloride or sulphate of potash in a proportion representing at least 7 per cent. of pure potash. Exceptions to the prohibition may be authorised under conditions to be laid down later.

GREECE.—Reduced rates for talc powder, phospatine, citric and tartaric acids, copper sulphate, lysol, etc., are now applicable to these goods imported into Greece from either France or the United Kingdom.

JAPAN.—Under Article 9 (Paragraph 1) of the Japanese Customs Tariff Law Ordinances may be issued granting drawback or exemption on sesame oil, various mineral oils, soda ash, and sulphur dyes, etc., and on imported materials to be used in the manufacture of goods for export.

BELGIUM.—A Royal Decree, dated August 28, and effective as from September 20, modifies the "coefficients of increase" applicable to the Customs duties on various chemical products, etc.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to October 15, 1926.

"CAPOSITE."

472,151.—For chemical substances used in manufactures, photography or philosophical research and anti-corrosives. Class 1. The Cape Asbestos Company, Limited, Guildhall Annexe, 23, King Street, London, E.C.2; Harts Lane, Barking, Essex; and Koegas, via Prieska, Griqualand, Cape Colony, South Africa; manufacturers and contractors. August 10, 1926. (To be Associated. Sect. 24.)

"NORMACOL."

467,415. Class 3. For chemical substances prepared for use in medicine and pharmacy. The firm trading as Chemische Fabrik "Norgine," Dr. Victor Stein, 178, Schwenkestrasse, Aussig-on-the-Elbe, Czecho-Slovakia; manufacturers. February 22, 1926. (By consent.)

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

SCIENTIFIC INSTRUMENTS.—A Wellington (N.Z.) firm of agents claiming a good connection with local Government Departments, also architects and builders throughout the Dominion, wishes to obtain the representation of British manufacturers of general scientific instruments. (Reference No. 415.)

SCIENTIFIC INSTRUMENTS.—An agent established in Buda-Pest since 1905, with travellers working the whole of Hungary, is desirous of securing the representation on a commission basis of British manufacturers of scientific instruments, etc. Correspondence may be conducted in English. (Reference No. 425.)

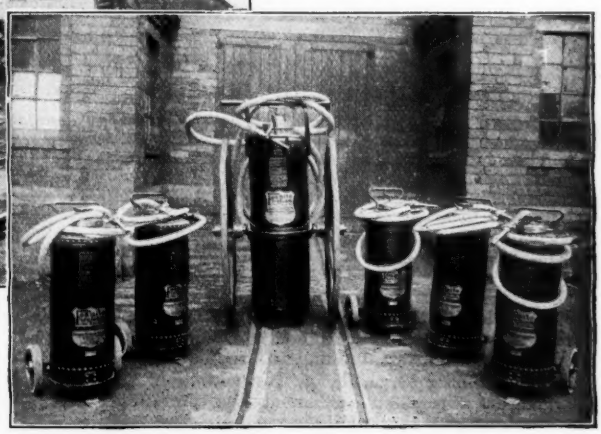
AGENT FOR MANUFACTURING CHEMISTS.—A commission agent in Sao Paulo, Brazil (a qualified chemist), is desirous of securing the representation of a British firm of manufacturing chemists. (Repetition of Reference No. 264.) (Reference No. 430.)

PHARMACEUTICAL PRODUCTS.—A chemist in Bratislava, Czechoslovakia, desires to secure the representation for Slovakia of a British manufacturer of pharmaceutical products. (Repetition of Reference No. 254.) (Reference No. 418.)

Cellulose Holdings and Investment Co., Ltd.

AT an extraordinary general meeting of the Cellulose Holdings and Investment Co., Ltd., in London on Friday, September 24, the following resolutions were carried unanimously: 1. That the share capital of the company be increased from £55,000, in 1,100,000 shares of 1s. each, to £500,000, in 10,000,000 shares of 1s. each, by the creation of 8,900,000 additional ordinary shares of 1s. each; 2. That the name of the company be altered to "International Holdings and Investment Co., Ltd.; and (3) A resolution effecting changes in the articles of association. The chairman stated that the board did not intend to confine its interests to the British Celanese Co., which was the case at present, but to widen the field of the companies' activities both at home and abroad. The number of shares they now held in the British Celanese Co. was 454,660.

A general view of Sneyd Colliery and a part of the special fire equipment—a 34-gallon and five 10-gallon Foamite Engines—installed to ensure that uncontrolled fire should not be a menace.



Safeguard production against the fire menace

DIMINISHED production as the outcome of a fire invariably means heavy loss. *This menace can only be guarded against by installing appliances adapted to the risk involved.*

Backed by a Company manufacturing every type of first-aid appliance, Foamite Fire Protection Engineers are able to prescribe *the right protection in the right place.*

LIQUID—or GAS—or FOAM

For ordinary fires, the "Firespray," which ejects mainly water, may be adequate. It is *not* recommended for extra hazardous risks where inflammable liquids are used or stored.

For some purposes a heavy gas, as produced by Carbon Tetrachloride machines like the "Fire-Gun," is a suitable extinguishing medium. How often though are such devices used upon fires which are outside their scope!

The only sure way to put out blazing petrol, paint, varnish, etc., is by the application of Firefoam, which is produced by Foamite appliances. By blanketing the surface of the liquid with a layer of tough, heat-resisting foam, the air is excluded and combustion ceases. Firefoam kills all ordinary fires. It is also used at numerous electrical power stations.

Foamite representatives are always ready to demonstrate upon request the form of protection best suited to your particular risk.

Send for a free copy of the booklet entitled *Extinguishing Oil and Other Fires.*

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Foamite Fire Protection

A Complete Engineering Service

Against Fire

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

EAST YORKSHIRE CHEMICAL CO., LTD., North Ferriby, manufacturers. (C.C., 2/10/26.) £17 15s. 11d. August 21.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an*—followed by the date of the Summary, but such total may have been reduced.*]

BRITISH TITANIUM CO., LTD., London, E.C. (M., 2/10/26.) Registered September 16, debenture securing all moneys and liabilities due and to become due to Associated Lead Manufacturers, Ltd., 3, New London Street, E.C.; charged on a tenancy agreement and premises comprised therein, also general charge.

CORBYN STACEY AND CO., LTD., London, E., chemists. (M., 2/10/26.) Registered September 17, £1,000 debenture and £500 (not ex.) debenture (subject to prior debentures), to W. H. Robertson, Southbeach, Waldegrave Road, Bickley, chemist; general charge. *£6,000. March 19, 1925.

FIRTH-BREARLEY STAINLESS STEEL SYNDICATE, LTD., Sheffield. Registered September 15, £10,000 1st debentures; general charge. *——. December 7, 1925.

HEYL'S COLOURS, LTD., Luton. (M., 2/10/26.) Registered September 16, £3,000 2nd debentures, part of £20,000; general charge. *£15,000. October 26, 1925.

PALMER (W. H.) AND CO., LTD., London, E.C., varnish manufacturers. (M., 2/10/26.) Registered September 4, Land Registry charge, to Westminster Bank, Ltd., securing all moneys due or to become due to the bank; charged on 80 and 82, Old Street, E.C. *Nil. August 24, 1926.

STEPHENSON (GEO.) AND SONS, LTD., Newark, iron-founders. Registered September 14, mortgage, to National Provincial Bank, Ltd., securing all moneys due or to become due to the bank; charged on property at Kelham. *——. August 4, 1926.

STRINGER AND CO. (SHEFFIELD), LTD., steel manufacturers, etc. Registered September 17, £2,000 debenture, to Branch Nominees, Ltd., 15, Bishopsgate, E.C.; general charge. *£2,000. June 29, 1925.

Satisfaction

EMANUEL (A.) AND SONS, LTD., London, W., lead merchants. Satisfaction registered September 15, £30,000, registered July 10, 1922.

London Gazette, &c.

Companies Winding Up Voluntarily

LONDON NITRATE CO., LTD. (C.W.U.V., 2/10/26.) By special resolution passed September 6, confirmed September 21, Frank Tobin, C.B.E., appointed liquidator, and authorised to carry into effect agreement for transfer of the undertaking of the company to the New Tamarugal Nitrate Co., Ltd. Meeting of creditors at the company's office, 3, Tithebarn Street, Liverpool, on Monday, October 11, at 12 noon.

New Companies Registered

BRITISH TRADE CORPORATION, LTD., 13-14, Austin Friars. Registered as a public limited company on September 25. Nom. capital, £1,000,000 in 500,000 "A" shares of £1 each and 200,000 ordinary shares of £2 10s. each. The British Trade Corporation was incorporated by Royal Charter on April 21, 1917, for 60 years, for the purpose of assisting the development of British trade and industries and of procuring for British manufacturers orders in connection with new overseas undertakings and the financing of contracts in connection therewith, etc. The directors include Robert G. Perry, C.B.E., of the Association of British Chemical Manufacturers, and Lennox B. Lee, J.P., of the British Alizarine Co., Ltd.

FORWOOD AND SELLAR, LTD., 26, Chapel Street, Liverpool. Private company. Registered September 27. Nom. capital, £15,000 in £1 shares. To acquire the business of a general merchant and insurance broker and forwarding agent as now carried on by C. S. Sellar at Liverpool, as "Forwood and Sellar," and to carry on the business of manganese ore merchants and factors and agents in the manganese trade, etc. Directors: C. S. Sellar (chairman), Meols Lodge, Hoylake, Ches. (director of Anglo-Georgian Manganese Imports, Ltd., and secretary of the Caucasian Manganese Syndicate, Ltd.), and W. Woodward.

Non-Return of Empty Chemical Drums

IN the Mayor's and City of London Court, on Wednesday, September 22, a claim was made by the London Chemical Co., chemical merchants, 91, Minories, against the Exceloid Co., Ltd., manufacturers, 34, Birley Street, Blackpool, for £22 19s. 1d. Council for the plaintiffs said that the action was originally brought for £22 19s. 1d., afterwards reduced to £21 9s. 4d. Of that sum defendants had paid £11 9s. 4d. a few days ago, the balance of £10 being the value of empty chemical drums which had not been returned. The defendants had contended throughout that the drums had been returned to the railway company, but in fact the plaintiffs had never received them until after the action was brought, and on September 7 they duly gave credit for £10, the value of the drums. He applied for legal costs incurred.—The Registrar asked whether he was to hear any evidence as to the date the drums were put on rail.—Counsel said that it was not disputed that until the plaintiffs got advice from the railway company or received delivery of the drums they were not liable. The defendants had to put the drums on the railway for delivery to the plaintiffs, and if the railway company made a mistake and did not deliver, the defendants could sue them.—A solicitor, representing the defendants, said he had a letter from the railway company stating that the plaintiffs were advised of the delivery of the drums before they issued their summons, but he was not in a position to prove the matter.—The Registrar remarked that in the normal way of business the defendants would not be entitled to credit until the drums reached the plaintiffs. He made an order for the costs to be taxed in the Registry, treating the amount as paid, and any objection to be raised upon the taxation. The plaintiffs' application for an allowance for advice upon evidence was allowed, together with costs of the application.

Queensland State Arsenic Mine

THE Queensland State arsenic mine at Jibbenbar (says the *Industrial Australian*) has been shut down for a considerable time past, owing to the drop in the price of arsenic. The Minister of Mines said recently that the closure of the State mine was due to the fact that arsenic had dropped so far below the cost of production. In these circumstances, he added, it would have been useless for the Government to continue operations on the present values. These values were a factor over which they had no control. The best white Cornish arsenic was recently quoted at £14 a ton, but less than two years ago the State was selling grey arsenic from Jibbenbar at £45 a ton, and it was being exported to America for use in the eradication of the boll weevil in cotton. Now other methods of dealing with the pest were employed, and arsenic was not needed.